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ESTIMATES COMMITTEE

Fifth Report

1951-52

THE CENTRAL WATER AND POWER COMMISSION

AND

MULTI-PURPOSE RIVER VALLEY SCHEMES

PARLIAMENT SECRETARIAT
NEW DELHI
March, 1952

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‡Ceased to be a member with effect from the 26th September, 1951.
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I

INTRODUCTION

I, THE Chairman of the Estimates Committee, beg to submit to Parliament this fifth report on the Central Water and Power Commission and the Multi-Purpose River Valley Schemes.

2. The Committee have considered at great length the organisation and the functioning of the various agencies connected with the planning, sanctioning and execution of the various Multi-Purpose River Valley Schemes. The Committee have examined the representatives of the late Ministry of Works, Mines and Power, the Ministry of Finance and the Central Water and Power Commission, formerly known as the Central Water Power Irrigation and Navigation Commission, the Chairman of the Damodar Valley Corporation, the Chief Engineer, Hirakud Project and Member-in-Charge of Projects in the Planning Commission. The Committee have also had an opportunity of an informal discussion with Shri A. Venkatachari, Chief Engineer of the Madras Government, and a member of the Board of Consultants to the Damodar Valley Corporation. In addition the Committee received a large number of memoranda and other papers on the subject in response to various questionnaires from the Ministry of Natural Resources and Scientific Research, the Damodar Valley Corporation and the Planning Commission. Two Sub-committees of the Committee also visited the two projects, namely, the Damodar Valley and the Bhakra-Nangal, and discussed the matters with the officers and the engineers concerned with these projects on the spot.

3. The Committee attach great importance to the execution of the Multi-Purpose River Valley Schemes for flood control, irrigation facilities and the generation of hydro-electricity. The faith of the people in the country is pinned on these schemes as they are expected to help in stepping up food production and giving a fillip to the industrial development. The whole economy of our country depends on the food position and the sooner we improve it the better it would be for alround improvement in our economic life in a comparatively short period. It is, therefore, of the utmost importance that the schemes are not only properly planned, but executed and completed according to plans and by the scheduled dates. A large proportion of our resources is at present being utilised in these development schemes and hundreds of crores of rupees are required before they begin to give any results. The Committee therefore note with great concern the slow progress at which some of the schemes which have been started are proceeding, despite the fact that crores of rupees have already been spent. The Committee feel that there are serious flaws in the administrative and organisational set-up of the various

projects and unless there is a radical change, there is no hope that our ambitions will be realised in the near future at a comparatively less cost. The Committee fear that if the present situation continues for any length of time, the cost of the projects may get out of control and not only the present but the future generations also may have to suffer as a result thereof. A great responsibility is cast upon the Government to see that monies are properly spent and full value is obtained for them. The Government have, therefore, to devote much more attention to this side of their activities than what they have done up till now. The Committee record with regret that Government have not so far given closer attention to these important problems nor have they kept a proper check on the progress of the schemes as they ought to have. There is yet time and if the government machinery moves quicker there is a very bright hope that large wastes may be avoided and the schemes completed in the shortest possible time.

4. The Committee visualise a three-tier organisation in connection with the successful execution and completion of the Multi-Purpose River Valley Schemes. The first and the higest tier would consist of the Cabinet, who on the advice of the Ministry of Natural Resources and Scientific Research, Planning Commission and the Central Water and Power Commission, would give broad policy decisions. This will be called the policy-making stage. The second tier would consist of the Planning stage, for which the Central Water and Power Commission would be responsible. They would act as fact-finding and initiating agency. It will be their responsibility to collect data, to make plans, to frame estimates and in short make a complete blue print for the scheme in question. It will be on the basis of this blue print that the Planning Commission and the Ministry of Natural Resources and Scientific Research would give policy decisions. Once a plan and the policy decisions are approved by the Cabinet they will form the main foundation and the outline of the scheme within which the agency charged with the execution of the project would act. The third and the last tier would consist of a *quasi* autonomous organisation charged with the responsibility of constructing the project on the lines of the approved plans and within the estimates framed therefor. The detailed functions and responsibilities of these various organisations and their co-ordination and interlinking would be found in the subsequent chapters of this report. The main points which the Committee would like to stress here are that there must firstly be an efficient, and reasonably fool-proof system. Secondly, the persons who are to man the various posts at the various stage must be selected carefully; they must possess initiative, drive and capacity for intelligent and hard work. They must be men who are in love with the job which has been entrusted to them so that they not merely fill up an appointment but further the purpose underlying the scheme. The third essential feature is that reasonably sound plans and estimates should be pre-

pared in advance and changes in them should be few and far between and made only after there is a decided necessity for changing any part of them. Also the policy-maker should know in advance what he is sanctioning and what his commitments are. He should not proceed on a purely rough scheme without details which may later on upset his whole planning and flow of finance. There must be rigidity about the plans which have once been approved after careful consideration and thought and they should not be subject to changes now and again on mere pretext of some better technical or other advice.

5. Another important point which should be borne in mind in this connection is that there should be adequate machinery for effective control and supervision over the day to day progress of work. This can be achieved if the man at the top makes it his business to watch the progress of the scheme as an integrated whole. He should have at any time a clear cut picture of the current position of the various stages of the project or part of the project and be in a position to plan ahead for the subsequent stage or stages.

6. The arrangement of this report is that the second chapter is devoted to the organisation and functions of the Central Water and Power Commission and its relations with the first and third tiers, namely, the policy-maker and the executive agency. The third, fourth, fifth and sixth chapters deal with the individual River Valley Schemes, namely, Damodar Valley, Hirakud, Bhakra-Nangal and Kakrapara, which are at present under construction and which the Committee have examined. Each of these chapters gives a short synopsis of the scheme, financial and administrative set-up progress of work so far made, the defects which the Committee have noticed and their recommendations in respect of that scheme. The seventh and the last chapter deals with the general recommendations which the Committee have framed after studying all the aspects of the schemes in detail. The Committee consider that if these recommendations are adopted in the case of the schemes which are at present in progress as well as in regard to future schemes which may be taken up hereafter not only would efficiency increase but also the cost and delays would reduced to a considerable extent.

For a better understanding of the organisational set-up of the various Multi-Purpose River Valley Schemes as envisaged by the Committee an organisational and control charge together with an explanatory note has been appended to his report. A summary of the recommendations made by the Committee has also been given in the Appendix.

7. The Committee desire to take this opportunity of thanking the Officers of the Ministries of Finance, Works, Production and Supply and the Natural Resources and Scientific Research, the Planning Commission, the Chairman, Central Water and Power Commission and the Chairman, Damodar Valley Corporation for placing before

them the material and information needed in connection with the preparation of this report. The Committee's thanks are also due to the Chief Engineers of the Bhakra-Nangal and Damodar Valley Projects for the help rendered by them to the Members of the Committee who visited the sites of the projects.

The Committee also acknowledge the great help received by them in the preparation of this report from the Secretary to Parliament, the Officer on Special Duty and their staff.

The Committee also record their deep sense of gratitude to the Honourable Speaker for the interest that he took in the work of the Committee and also for the advice that he gave to the Committee from time to time.

II

THE CENTRAL WATER AND POWER COMMISSION

8. The Central Water and Power Commission was reorganised in April, 1951, by the amalgamation of the Central Water Power Irrigation and Navigation Commission, generally known as C.W.I.N.C., and the Central Electricity Commission. The Central Water Power Irrigation and Navigation Commission was first constituted in the year 1945 and the Central Electricity Commission in 1948. Last year, when the Estimates Committee examined the estimates of the late ministry of Works, Mines and Power, they recommended in para. 99 of their Fourth Report that on grounds of economy and efficiency all work relating to thermal and hydro-eclectric power should be centralized at one place and suggested that the hydro-electric functions of the Central Water Power Irrigation and Navigation Commission might be transferred to the Central Electricity Commission which should continue as a separate organisation. The Committee note that Government have accepted the principle underlying their recommendations and brought about a merger of the two organisations into a single Commission.

Functions

9. The Commission is charged with the general responsibility of initiating, coordinating and furthering, in consultation with the State Governments concerned, schemes excepting the Damodar Valley Scheme, for the control, conservation and utilisation of water resources throughout the country for purposes of irrigation, nevigation, flood control, water power generation and thermal power development. The Commission will, if so required, undertake the construction and execution of any such schemes.

Personnel

10. The Commission is composed of a Chairman and four Members, two of whom direct the Water wing and the other two direct the Power wing and such other full-time or part-time Members as Government may from time to time find necessary. The Commission is assisted by a wholetime Secretary.

Branches

11. The technical work of the Commission is at present divided into eight Branches*:

i. Irrigation.

ii. Hydro-Electricity.

*The organisation of the Commission is as it stood at the time of the examination of the material.

iii. Navigation.

iv. Waterways.

v. Hydrology.

vi. Designs.

vii. Construction.

viii. Statistics and Publications.

Irrigation Branch: This Branch deals with all problems relating to irrigation and domestic water supply and also with the allied problem of water conservation and flood control.

Hydro-Electricity Branch: This Branch deals with all matters relating to hydro-electric developments and with the conservation and regulation of water supply to the extent they affect the development of hydro-electric power and multi-purpose projects.

Navigation Branch: This Branch deals with improving and encouraging inland navigation in the country and also deals with deep sea ports to the extent they affect inland navigation. It also deals with problems of flood control and waterways to the extent they are related to inland navigation.

Waterways Branch: This Branch deals with natural and artificial waterways, both navigable and otherwise, and with the characteristic control and conservation of such waterways.

Hydrology Branch: This Branch deals with water resources (both surface water and ground water of India), their cyclic trends and seasonal distribution, sources from which these waters are derived, *i.e.* precipitation comprising rainfall, snowfall and glaciers.

Designs Branch: This Branch deals with designs work for all Branches both in respect of fundamental concepts and specific projects. The main function of this Branch is to evolve the most economical design consistent with absolute safety and standardised designs, design data and the methods of designs to the maximum extent possible.

Construction Branch: This Branch deals with the construction activities of the projects undertaken for construction or advised by the Central Water Power Irrigation and Navigation Commission, including plant procurement, stores purchase, plant lay out, construction methods and all other formalities and steps required for tha. purpose.

Statistics and Publications Branch: This Branch deals with statistical work for other Branches, collects the details and results of their activities, publishes these in a proper form and through the Library and Information Bureau makes such information available to the States and other bodies in India and abroad.

In addition to the above Branches there are the following Sections to carry out the duties of the Commission:

Administration Section I: Deals with gazetted establishment matters, office procedure, etc.

Administration Section II: Deals with matters relating to non-gazetted establishment.

Accounts Section: Prepares pay bills of staff and audits the initial accounts and contingency bills.

Budget Section: Deals with all matters relating to the budget of the Central Water Power Irrigation and Navigation Commission and keeps a check over the monthly expenditure.

General Section: Deals with other miscellaneous duties such as procurement, maintenance, distribution of furniture, office equipment, etc.

Stores Section: Procures stores, plant and machinery for the various river development projects undertaken by the Commission in India as well as abroad.

Receipts and Issue Section: Deals with the distribution of incoming and out-going 'dak' and typing work.

Position of the Chairman

12. The Chairman of the Central Water and Power Commission acts as the Consulting Engineer to the Government of India and also as *ex-officio* Additional Secretary in the Ministry of Natural Resources and Scientific Research. The practice is that the proposals are framed by the Central Water and Power Commission and submitted to the Additional Secretary in the Ministry of Natural Resources and Scientific Research for approval. From the functions of the Commission enumerated in paragraph 11 above the Commission is charged not only with fact-finding and planning and coordinating the work but also with the responsibility for construction work in pursuance of such plans which the Government of India may decide. It follows that the same person who, as Chairman of the Commission, has prepared proposals and estimates and submitted them to Government for sanction would in his capacity as Additional Secretary in the Ministry of Natural Resources and Scientific Research approve the same proposals and after the proposals have been approved take the responsibility for undertaking construction work in accordance with the very same proposals. It is thus clear that the whole work of the initiation of proposals, planning, policy-making and execution is done by a single organisation or authority or even an individual in different capacities. The arrangement is not only inappropriate but replete with dangers, drawbacks and imperfections, which may cause a severe blow to the entire programme of the development of River Valley Schemes upon which the prosperity of the country so much depends. A huge expenditure is incurred on these schemes and it is of the utmost importance that there should first be a proper system of handling these matters and then the men in charge at the various stages should be capable in their own spheres. It is of the

utmost importance that there should be proper checks, controls and superintendence at each stage and there should be different authorities, fewer in number and competent, to give the whole system a life, a vitality and ensure reasonable safeguards against inefficiency, waste, delays, corruption, fraud and favouritism.

Commission to be a separate body from the Secretariat

13. The Committee recommended last year (*vide* para. 2 of their Second Report) that all posts of Additional Secretaries should be abolished. Apart from the general considerations urged therein, the Committee are strongly of the opinion that the Commission should be quite a separate body from the Secretariat and the Chairman of the Commission should have no *ex-officio* status in the Ministry or a hand in the administrative decisions. The Committee also feel that the duties of the Commission should be limited to initiating, coordination and furthering schemes for the conservation and utilisation of water resources throughout the country. The functions relating to the construction of any such schemes should be taken away from the Commission and entrusted to separate *ad hoc* bodies. The composition, functions and the mode of working of these *ad hoc* bodies will be dealt with by the Committee separately. At this stage the Committee shall confine itself to the functions of the Central Water and Power Commission and its relations with the Government and the *ad hoc* organisation charged with the responsibility of construction and execution.

Technical aspects of a scheme: Role of the Commission

14. The Committee consider that the functions of the Commission should be to investigate, make plans, designs, draw up estimates, indicate priorities in respect of various schemes and the target dates within which the various stages of the scheme should be completed. It should also be the function of the Commission to indicate the manpower required and in case the scheme is finally undertaken the machinery, plant, tools, which would be needed and how they can be procured. The Commission must also survey comprehensively the advantages flowing from a particular scheme in all its stages and how those advantages should be integrated or utilised in the other development programmes. All these estimates, details and other particulars must be drawn up as accurately as possible by the Commission who should also indicate the most economical methods by which the schemes can be undertaken. In short the Commission must prepare a complete blue print for a particular scheme in order to enable the Government to come to conclusions as to the necessity and advisability of undertaking a particular scheme at a particular time. The Commission should confine its activities to the development of river valley schemes in respect of irrigation, navigation, flood control, soil conservation, water-logging and hydro-electric power generation.

After the scheme is thus prepared and all the estimates of cost, etc., have been worked out and approved by the Commission it shall

be forwarded to the Ministry of Natural Resources and Scientific Research.

Administrative and financial aspects: Role of the Government

15. While the Commission should be fully responsible for the technical side of the scheme the Government will carefully examine the administrative and financial sides of it before it is proceeded with. For this purpose a Committee consisting of the Chairman of the Commission, Secretary of the Ministry of Finance, and Secretary, Ministry of Natural Resources and Scientific Research presided over by the Minister for Natural Resources and Scientific Research should scrutinise the details thoroughly and the scheme as finally approved by them should be referred to the Planning Commission. After the Planning Commission has advised on the priority or on the question of undertaking the scheme, the whole scheme together with their advice should be considered by the Cabinet and further action should be taken in accordance with their orders. The scheme as is finally approved by the Cabinet will form the main basis upon which it has to be proceeded with. Any variations from the principles underlying the scheme should not ordinarily be made except with the prior approval of the Cabinet and in accordance with the processes which the Committee shall describe separately.

Method of selection and recruitment

16. The Chairman and Members of the Commission should each be qualified engineers possessing high technical qualifications and vast experience in the respective branches of engineering. The Committee are not, however, satisfied with the present method and mode of recruitment of the Chairman and Members of the Commission. They suggest that selection of men to these posts should not be confined to a limited number of persons possessing certain experience. The Committee in their Second Report on the Reorganisation of the Ministries and Departments of the Government of India have observed as follows:

> "It has come to the notice of the Committee that the field of selection of certain technical appointments such as Engineers is restricted to a certain category of persons only. As an instance, the Chief Engineer of C.W.I.N.G. is selected from one of the existing or retired Chief Engineers of States or Central Government. It is obvious that an officer of this category is seldom found and then a plea is advanced that competent persons are not available. It goes without saying that, when the field of selection is so limited, a competent person will be found with great difficulty. The Committee cannot understand why the field of selection is limited in such cases and why the selection is not wide enough to cover other categories of officers also. It is true that some tests should be laid down; but these tests should not be

so hard that it will be difficult to find any one to satisfy the test. If a person has not risen to the rank of a Chief Engineer it does not mean that he has not got the capacity and ability of a Chief Engineer. It is therefore urged that in making such appointments the selection should be rather broad based and should cover a wider field from which better choice can be made. This applies to other posts of technical character also and it is hoped government will give serious consideration to this matter. The Committee feel that a list of all the technically qualified personnel should be prepared and added to from time to time so that the list may be consulted when making appointments to the various posts."

The Committee therefore recommend that a list of experienced engineers in all branches from all parts of the country should be drawn up and a selection both for the Commission as well as to the executive posts in the Commission should be made from that list. The list should contain names of engineers who have at least rendered fifteen years service as Executive or Superintendent Engineer and above. The Committee are confident that if selection is broad based a good number of capable men would be available to man the posts in the Commission.

Directors

17. The Commission is at present assisted by nine Directors, each in-charge of a Branch mentioned in para. 11 above. The pay of a Director ranges from Rs. 1,800 to Rs. 2,000 p.m. In view of the scope of functions under our proposals being of a limited character confined mainly to surveying, planning and coordinating, the Committee are of the opinion that the various Branches of the Commission should be reorganised. The functions of Navigation, Hydrology and Waterways Branch should be entrusted to one Director. A second Director may be in-charge of Irrigation. One Director each for Designs, Organisation and Research may be entrusted with the duties of the respective Branches. All work relating to hydro-electricity and thermal powers should be centralised under one Director. The Branch dealing with Stores and Equipment will no longer be required if the Construction work is taken away from the Commission. The function of the Statistics and Publication Branch is mainly to collect information from the various States Governments and other sources. The Committee do not find any justification for entrusting this work to a Director. The Committee recommend that the post of Director of this Branch should be abolished and it should be placed under the charge of a Deputy Director. To sum up it may be stated that if the recommendations set out above are accepted the number of Directors would be reduced from nine to five, with a corresponding reduction in the ranks of Deputy, Assistant and Extra Assistant Directors.

Research Station, Poona

18. The Research Station at Poona undertakes the investigation and research of irrigation, river training and various multi-purpose projects before it can be decided whether or not their construction should be taken in hand. A capital expenditure of Rs. 23·91 lakhs was provided in the estimates for the year 1950-51 for the reorganisation and expansion of the Station. The Scheme provides for the acquisition of land and construction of buildings, and equipment for the expanded Research Station. All works are expected to be completed in the next two years ending 1952-53. It is understood that the Scheme has not yet made much progress. In view, however, of the fact that the development programme has been slowed down and construction of fresh projects is not being taken in hand on account of the financial stringency it is suggested that the position regarding the proposed expansion and reorganisation of the institute should be reviewed and no further financial commitments made unless there is a definite possibility of expansion of work in the near future. It is of the utmost importance that at the present moment all unnecessary expenditure should be avoided and, therefore, schemes which are not inescapable should be deferred for consideration. Schemes which involve expenditure of a non-productive kind, for example, construction of buildings, filling up of posts for which there is no adequate work etc., should be deferred until better times. For the same reasons it is considered that some of the posts of Research Officers and Assistant Research Officers which have been lying vacant should be kept in abeyance for the time being.

Need for reorganisation

19. The Central Water and Power Commission is now engaged on investigation and surveys on Kosi Project in Bihar and Nepal, and Coorg, Ganga Barrage, Madhya Pradesh, Sabarmati and Narbada Valley Projects. According to the revised figures furnished to the Committee it is observed that the estimated cost of investigations is Rs. 2·7 crores (not after recoveries of residual values of equipment). The expenditure up to the end of August, 1950, including (Liability) was Rs. 1·07 crores. The Committee were told that the investigations relating to Kosi Dam Project would be completed by 1950-51. Due to earthquakes and floods in Assam the entire topography of the Dihang River Valley has changed. As regards other projects it is understood that in view of the financial position the prospects of construction of new projects in the near future were very remote and therefore investigations on the remaining projects were being stopped except for discharge and other observations for the collection of statistical, hydrological and meteorological data. In the event of these investigations being stopped or in the case of investigations of the Kosi Project being concluded, the following gazetted and non-gazetted establishment would be rendered surplus.

TABLE I

Statement showing gazetted and non-gazetted establishment to be rendered surplus

Name of Project	Class I	Class II	Class III	Class IV
Kosi	5	5	113	52
Assam	7	7	55	24
Coorg	2	2	21	6
Gan Barrage	6	4	66	35
Madhya Pradesh & Narbada Valley	9	8	251	47
Sabarmati	2		34	29
Total	31	29	440	139

The discontinuance of the investigation work and consequent reduction in staff, both gazetted and non-gazetted, will entail reorganisation of the whole office of the Central Water and Power Commission. The Committee recommend that a Committee consisting of the representatives of the Ministry of Home Affairs, Ministry of Finance, and the Ministry of Natural Resources and Scientific Research should be set up to examine in detail the reorganisation of the Commission and to explore what economies of expenditure could be effected consequent on the overall reduction in work as envisaged above. The staff requirements of the reorganised office should be commensurate with the work remaining to be handled by it. In the meantime no new posts either in the gazetted or non-gazetted cadre should be created or filled up.

Establishment

20. There are at present 9 Superintendents, 3 Assistants-in-charge, 209 Assistants and Clerks, 46 Stenographers and Stenotypists and P.As. to Members and 140 peons sanctioned for the Central Water and Power Commission Office. The Committee fail to see the justification for the employment of such huge Ministerial staff for a technical organisation like the Central Water and Power Commission. While in some Sections dealing with establishment, accounts, and administration matters there may be reasons for employing Ministerial staff, the Committee cannot appreciate why such a huge Ministerial staff is necessary when the bulk of work which is essentially technical involves handling by technically qualified

Officers and Consultants themselves. The Committee have recommended in para. 14 of their Second Report that in technical organisations the Advisers must attend to work themselves and the practice of employing Ministerial staff should be discarded. The Committee, therefore, consider that the Ministerial staff should be reduced to the absolute minimum, *i.e.,* for such Branches only in which they can usefully be employed. The Committee have also recommended that instead of sanctioning a Stenographers for each Junior Office, a pool of Stenotypists or Stenographers should be created for them. It is hoped that these suggestions would be followed in the office of the Central Water and Power Commission also and the number of such posts reduced considerably. In regard to Class IV staff the Committee have already recommended the adoption of Messenger Service System and it is visualised that if that suggestion is adopted there would be a reduction of about 60 to 70 per cent. in their ranks in the Central Water and Power Commission Office.

Travelling Allowances

21. From the figures of Travelling Allowances furnished to the Committee it is observed that during the year 1949-50 and 1950-51 the expenditure amounted to Rs. 1,69,321 and Rs. 1,85,000 respectively and during the year 1951-52 it is estimated to be Rs. 2,05,000. It is considered that the expenditure on Travelling Allowances should be drastically cut and frequent touring by officers should be stopped. There should at least be a reduction of 50 per cent. in the amount. The Committee also find that Rs. 3,53,000 have been provided for under 'Other Charges' in the Budget for 1951-52. This appears to be too much for the responsibilities entrusted to the organisation Considerable expenditure is incurred on telephones which are provided to Junior Officers at their residences. This appears to be unnecessary. Telephones at residences of Officers except in cases in which it is very necessary to sanction a telephone should be discontinued. Similarly Trunk-Calls should be minimised and expenditure brought under control. In order to enable the office of the Central Water and Power Commission to enforce strict economy in expenditure the provision under this head in their Budget estimates should be cut by about 50 per cent. Instances have been brought to the notice of the Committee that furniture and certain types of stores were transported from Delhi to Orissa and other sites where investigations on projects were carried on. Apart from the fact that they entail payment of railway freight and other incidential charges the Committee do not see valid reasons for resorting to such a course especially when the articles can be purchased locally at a comparatively cheaper price. The Committee are of the opinion that local talent and material in the execution of work should always be utilised and the practice of importing outside labour and stores should be avoided as far as possible.

III

DAMODAR VALLEY PROJECT

22. The Damodar river rises in the Chota Nagpur Hills in Bihar and flows down through Bihar and Bengal. It has a large number of tributaries the most important of them being the Barakar which joins it about six miles below Panchet Hill near the Bihar-Bengal boundary. The country near and about Burdwan is flat. Therefore, whenever the Damodar river rises to its level its waters spread over a large area in Bengal and cause great havoc. After the 1942 flood in the Damodar river, the Government of Bengal appointed a Committee to examine how such disastrous floods could be prevented. The Committee recommended the construction of a series of dams. On consideration of this report, the Government of India came to the conclusion that a scheme of multi-purpose unified development of the Damodar and its tributaries should be drawn up. With that end in view a meeting of the representatives of the Central Government and the Governments of Bihar and Bengal was held on the 3rd January, 1945 and it was decided that the Central Technical Power Board should carry out necessary preliminary investigations in consultation with the technical experts of Bengal and Bihar.

Preliminary Report

23. The Central Technical Power Board submitted a preliminary report suggesting the construction of a series of 8 dams. The Scheme envisages the control of floods, the generation of 350,000 k.w. of power and the supply of water for irrigation to approximately one million acres of cultivable land, all of it in Bengal. The Scheme also visualises certain inland navigation facilities and aims at the supply of electrical power to the surrounding areas. To achieve the objects in view it was proposed to construct dams at Maithon, Panchet Hill, Tilaiya and Konar for the present. The dam at Panchet Hill will be on the main Damodar river and those at Maithon and Tilaiya will be on its tributary, the Barakar. The dam at Konar will be on an independent stream called the Konar river, before it joins the Barakar.

At all these dam sites hydro-electricity will be generated but the storage capacity of the dams being variable the peak generation can be only between July and September. During the remaining period from October to June the demand load has to be met by supplemental thermal power production. Therefore, it is proposed to build a big thermal station at Bokaro and distribute the electricity so generated from both the hydro-electric and thermal sources through a common transmission system and thus carry electricity to outlying areas like Jamshedpur, Kharagpur, Chittaranjan, Sindhri and to various collieries in the area.

Technical Mission

24. A Technical Mission was brought out from the U.S.A. in 1946 to examine the scheme. The report of the Central Technical Power Board was approved by the Technical Mission. Thereafter the preliminary report of the Central Technical Power Board was considered at inter-State meetings in 1946 to 1947. It was proposed that the construction work and management of the Scheme should be entrusted to an Authority similar to the Tennessee Valley Authority in America by an Act of the Legislature.

The D.V.C. Act

25. Accordingly, the Damodar Valley Bill was introduced in the Constituent Assembly (Legislative) in December 1947 and passed on the 27th March, 1948. The Act provided for the establishment and regulation of a Corporation for the development of the Damodar Valley in the provinces of Bihar and West Bengal. The Damodar Valley Corporation was actually established on the 7th July, 1948. The functions of the Corporation shall, among other things, be the promotion and operation of schemes for irrigation, water-supply and drainage, the generation, transmission and distribution of electrical energy; and furtherance of schemes for flood control, navigation, afforestation, development of agricultural and industrial economy, and general well-being in the Damodar Valley. Under sections 22 to 24 of the D.V.C. Act the Corporation has been vested with wide powers to achieve the above objects.

Administrative set-up of the Corporation

26. The Corporation consists of a Chairman and two Members. The Chairman is the administrative head of the Corporation. There are also a Financial Advisor and a Secretary who are appointed by the Central Government in consultation with the State Governments of West Bengal and Bihar. In administrative matters the Corporation is assisted by two Deputy Secretaries and one Director of Personnel and one Purchase Officer, one Chief Information Officer and subordinate staff consisting of 215 Clerks and 83 Class IV servants.

Rehabilitation and Development Department

27. The Committee understand that the Rehabilitation and Development Department of the Damodar Valley Corporation is staffed by as many as 60 persons, with a Director at its head, who is paid a salary of Rs. 3,000 p.m. The scale of pay of the Deputy Director of Rehabilitation and Development is Rs. 350-950, while those of the 3 Assistant Rehabilitation Officers are Rs. 200-450, 220-750 and Rs. 200 (fixed) respectively. There is also an Engineer attached to this organisation who is paid a salary of about Rs. 4,000 p.m. The

Committee feel that the salary of the Director is very high as compared to the salaries of the Deputy Director and Assistant Rehabilitation Officers. The pay of a Director in charge of a Branch in the Central Water and Power Commission ranges from Rs. 1,800 to Rs. 2,000 p.m. The Committee, therefore, recommend that the salary of the Director of Rehabilitation and Development should be reduced and brought on par with that of a Director in the Central Water and Power Commission. It is also recommended that the strength of the staff of the organization should be reviewed and refixed after carefully assessing the volume of work and the scales laid down for each category of the staff.

28. The Committee examined carefully the work done by the Rehabilitation and Development Department and also studied it on the spot when they paid a visit to the works. This Department was established as a result of a decision that those persons who were displaced in consequence of the operation of the scheme should be provided land for land and house for house. The Committee are unable to understand why it was thought necessary to entrust the work to the Corporation whose hands were already full with other work connected with the construction of dams, etc. It could have easily been handed over to the State Governments concerned who had the necessary machinery for reclamation of land and distributing to the affected persons. Even if it is agreed that the Corporation itself should do it, it is highly debatable that they have done it efficiently and economically. The Committee have reasons to believe that this Department is over-staffed, the salaries are incommensurate with the nature of work performed by the various officers and staff and the responsibilities entrusted to them. The quality of work so far done is far below the ordinary standards of efficiency. It was the experience of the Committee that the houses that had been constructed for the displaced persons had given way before they had been occupied by the persons concerned. The Committee are not satisfied that there is an absolute necessity for this organisation and that the work done by them is such as to justify its continuance under the D.V.C. The Committee, therefore, recommend that a Committee should be appointed to investigate the work done by this organisation and whether it was commensurate with the money spent and whether the work should more properly be entrusted to the State Governments. The findings of the proposed Committee should be placed before the Estimates Committee.

Engineering set-up of the Corporation

29. On the Engineering side the Corporation consists of a Civil Engineering Division and an Electrical Engineering Division. The Civil Engineering Division is sub-divided into (i) Planning and Design; (ii) Construction; (iii) Drilling; (iv) Barrage and Irrigation; (v) Surveying and (vi) Hydraulic Modules and Soil Mechanics.

Sub-divisions (i) to (iv) are each under an Engineer-in-Charge while (v) is under a Chief Surveyor and (vi) under the Director, River Research Institute, West Bengal. They have also necessary subordinate staff consisting of 311 technical and 227 non-technical hands in the regular establishment while 656 hands are employed in the technical work charged establishment.

On the Electrical side there is a Resident Engineer for Bokaro Thermal Station, a Superintending Engineer for Transmission System and an Executive Engineer for Power House for construction camps who are assisted by 268 technical and 97 non-technical hands.

All these appointments are made by the Corporation and the terms and conditions are fixed by the Corporation in accordance with the regulations framed under Section 60 of the Damodar Valley Corporation Act (1948).

Technical consultants to the Corporation

30. In regard to the erection and management of the Bokaro Thermal Station, the Corporation is advised by the Kuljian Corporation of the U.S.A. The Kuljian Corporation has deputed a Project Officer and Comptroller to work at the site of the Station in close consultation with the engineers of the D.V.C.

Konar Dam Project: The Damodar Valley Corporation originally appointed the Societe des Batignolles of France for the preparation of designs and target estimates. As the designs prepared by this firm were not acceptable to the Corporation, they have now appointed Gruner Brothers of Switzerland as their consultants for preparing fresh designs and estimates.

Maithon Dam: Messrs. Harza Engineering Company of the U.S.A. are the consulting engineers for the designing of this dam.

In addition to the above a Board of Consultants consisting of Messrs. Harza and Harpet, Engineers from the U.S.A. and Mr. Venkatachari, Chief Engineer, Madras Government, have been appointed by the Corporation to advise them on various problems relating to the designing, construction and operation of the works proposed for the development of the water and power resources of the Damodar Valley.

On the Electrical and Irrigation sides the Corporation has the advice and assistance of the Central Electricity Commission. The services of the Central Water and Power Commission are also available to the Corporation, whenever required.

Financial advice

31. The finances of the Corporation are contributed by the three participating Governments in accordance with Sections 30 to 33 of the Damodar Valley Corporation Act. The Corporation is free to

incur expenditure in connection with the furtherance of the Scheme after reference to the Financial Adviser. The Financial Adviser has to advise the Corporation on all matters relating to revenue and expenditure. He has the right to attend every meeting of the Corporation but has no right to vote. He also has the right to refer to the Corporation any matter which in his opinion ought to be brought to their notice. He is responsible for the preparation of the budget of the Corporation, the compilation of the annual financial and other statements and for supervision of the manner in which the accounts of the Corporation are maintained and made available for audit.

Audit

32. The financial transactions of the Corporation are audited by the Corporation and Auditor General.

Foreign expenditure

33. In regard to foreign expenditure the Corporation has to obtain prior approval of the Government of India before entering into any commitments. In regard to the foreign contracts to be entered into by the Corporation, a convention has been established since the 9th May, 1949, that the Corporation should refer to the Government of India before execution, any contract or agreement which they propose to enter into other than arising as a result of a public call for tenders or quotations and of which value is definitely ascertainable at the time of placement of the contract or signing of agreement.

Technical aspects of the Scheme

34. The Scheme consists of (i) 8 storage dams with hydro-electric stations, two auxiliary plants with a total installed capacity of 2,40,000 k.w., (ii) and additional 200,000 k.w. steam power station to even out seasonal variations of hydro-electricity, (iii) a power transmission grid which will initially include 475 miles of 66 k.v. and 100 miles of 33 k.v. lines, (iv) an irrigation barrage with associated canals and distributaries measuring 1.553 miles, and (v) 90 miles long irrigation-*cum*-navigation canal.

Together with dams it will insure the Valley against the floods up to 1,000,000 cusecs as against the highest recorded flood of 650,000 cusecs. The barriage and irrigation project will provide year-round irrigation for approximately 1,000,000 acres which is expected to produce 9,700,000 maunds of extra food annually. The direct benefits of the scheme, translated in terms of current prices are expected to add Rs. 25 crores yearly to the national Exchequer. The cheap power that will be produced will also give a fillip to the rapid industrial expansion of the valley.

Flood Control

35. The expenditure on flood control is allocable equally between the Central Government and the Government of West Bengal under Section 36 of the D.V.C. Act.

The total investment of Rs. 12,20,91,000 on this account cannot however, be productive. The D.V.C. has estimated that depreciation, maintenance and operation on this comes to Rs. 3,60,000 per year. The result will be a net loss of Rs. 46,33,000 per year. But this is really a productive investment because the accruing indirect benefits due to non-submersion and protection to crops will be enormous.

Power

36. All the three participating Governments have agreed to bear the expenditure equally. The fact, however, is that the States of Bengal and Bihar take loans from the Centre which they pay to the Corporation.

The installed capacity of power, both Thermal and Hydel, (from four dams and Bokaro) will be 275,000 k.w. while the estimated firm capacity will be 193,000 k.w. Electrical energy from the grid will be available from 1953-54 and by then 80 per cent. of the transmission system will be completed. This is, however, dependent on the completion of the dams. Tilaiya is a tiny affair (only 2,000 k.w. firm capacity) and Konar will give a firm capacity of 33,000 k.w. Panchet Hill and Maithon are still in the very early stages and the grid has to depend on Bokaro Thermal Station alone for a while. Even according to the D.V.C. figures the anticipated load will be far in excess of the available generating capacity (Table II).

TABLE II

Statement showing the anticipated load and generating capacity

	By 1955 5th Yr. KW	By 1960 10th Yr. KW	By 1965 15th Yr. KW
Anticipated load	4,94,000	6,80,000	7,72,000
Available generating capacity . .	1,88,000	1,82,000	1,74,000
Balance of demand . .	3,06,000	4,98,000	5,98,000

These figures are contingent upon the fulfilment of all constructions according to schedule. This anticipation is not likely to prove correct and so the firm supply from the grid will be a deficit.

While assuming that demand for power will be in excess of supply, that the distribution agencies will be ready to take over, that

the existing consuming units will be ready to change over, from their own generating units and that the new expected industries will be ready in time, the simple point for consideration will be whether the D.V.C. will be able to supply at its anticipated rate of ·66 of an anna per k.w. The Calcutta rate is ·675 anna which is not much higher. It has, therefore, to be made sure that the D.V.C. should be able to sell at the rate of 66 anna per k.w., if not at cheaper rate. Taking things as they are this also seems improbable in the next decade. The Committee recommend that the question of the cost of production of power should be studied carefully and the result of such studies placed before the Estimates Committee in due course.

Irrigation

37. The Government of Bengal and Bihar share the expenditure in proportion to the water that is allocated to them. The capital expenditure on any construction inside their respective territory specifically meant for their benefit is chargeable to the State concerned.

Budget

38. The initial assessment of the entire Budget made in the year 1945 by Voordouin was placed at Rs. 55 crores. This estimate is now considered to be out of date on account of the rising cost of plant, machinery and labour. The D.V.C. think that no straight computation of the overhead charges can be made as it has to execute work of a great magnitude through agencies employed on varying terms. The Government is investigating the matter and trying to keep the overhead charges to the lowest level possible. The Committee would like to know in due course the result of the investigations.

On the 3rd March, 1951 a Conference was held in New Delhi. It was attended by representatives of all the participating Governments and it was decided that the work of Bokaro and Konar dams should proceed on the basis of the revised estimate but the D.V.C. should not undertake any new schemes without submiting complete plans and estimates to the participating Governments whose scrutiny and concurrence is necessary before the Scheme is proceeded with and the expenditure thereon incurred.

It is now understood that the revised estimates of the whole Scheme may be somewhere between Rs. 110 and 120 crores.

Expenditure so far incurred

39. The following Tables III and IV show the amounts so far spent on the various schemes of the D.V.C. and the contribution made by each participating Government.

TABLE III

Funds provided by the Governments of India, West Bengal and Bihar to the D.V.C. till March 31, 1951

	1948-49 (*i.e.* from July 1948 to 31st March 1949)	1949-50	1950-51
	Rs.	Rs.	Rs.
Government of India . .	69,26,767	1,66,92,000	2,50,09,400
Government of West Bengal .	91,16,633	2,10,87,000	3,88,54,000
Government of Bihar . .	61,37,000	1,65,30,000	1,34,96,000
Total .	2,21,80,400	5,43,09,000	7,73,59,400

N.B.—The figures shown above include the proceeds from the World Bank Loan amounting to Rs. 18·5 millions for Bokaro-Konar-Transmission Project.

TABLE IV

Actual expenditure incurred by the D.V.C. till 31st March, 1951

(In crores of rupees)

Name of Project	Preliminary Estimates as per Voordouin for the entire Damodar Scheme.	Preliminary Estimates with allowance for extended scope for first phase only.	Revised Estimates for the first phase with extended scope *i.e.* Col. 2 adjusted for increase in price and devaluation.	Actual direct expenditure up to 31-3-51 (Provisional).	Indirect expenditure (tentative allocation to projects).	Total expenditure up to 31-3-51, *i.e.* Cols. 4 and 5 (Provisional).
	1	2	3	4	5	6
Tilaiya	2·15	2·15	1·96	0·69	0·30	0·99
Konar No. 1 . . .	2·91	2·91	7·09	1·44	0·55	1·99
Konar No. 2 and 3 . .	..	3·53	3·53	..	..	..
Maithon	7·93	7·93	11·85	0·76	0·39	1·1
Panchet Hill . . .	9·08	9·08	13·38	0·12	0·11	0·23
Balpahari	4·60	..	..	..	..	..
Aiyar	10·74	..	..	..	..	..
Bokaro	1·24	...	..	..	..	..
Bermo	0·61	..	..	..	..	..
Bokaro steam station . .	7·70	9·20	12·06	5·63	0·63	6·26
Transmission . . .	2·30	5·63	6·30	1·84	0·20	2·04
Irrigation Barrage and Canals including drainage.	5·74	10·99	16·59	0·56	0·06	0·62
Navigation . . .	..	2·22	2·22	..	..	..
	55·00	53·64	74·98	11·04	2·24	13·28

Progress of work (October 1947 to July 1951)

40. (i) *Bokaro Thermal Station*: Tenders for the Bokaro Steam Plant were invited in March 1948. The tender of the International General Electric Company was accepted by the Corporation in November, 1948 and the Kuljian Corporation, U.S.A. were appointed as the Consultants for the erection and initial running of the Bokaro Thermal Plant. For obtaining coal for the Thermal Station, the Corporation have taken on lease the Bermo Seam Colliery from the Railway Board. The Corporation have also been laying transmission lines up to Jamshedpur and Chittaranjan so as to eventually link up Calcutta and Hirakud. The Board of Consultants have cast doubts on the safety of 762 as a steam plant floor elevation. This elevation was decided upon by the D.V.C. after a study of the then available evidence, which has since been contradicted by a high flood level mark on the E.I. Railway bridge pier on the Konar River about one mile up-stream of the Steam Station site. The Consultants have advised a further careful study of the evidence. Regarding the location of Bokaro Steam plant, the Consultants feel that it is "unfortunate that the steam plant could not have been located at Konar-3 dam where re-circulation of condenser water would have permitted any ultimate desired size of plant. The only partial remedy at this time would appear to be higher barrage at the Bokaro Thermal Plant". This suggestion involves increased capital which already considerably exceeds the original estimate.

The Bokaro Thermal Station has swallowed practically all available finance. Such a power-generating station, constructed on its own merits and even without combining it with the D.V. irrigation and flood control scheme, has much to commend it. It would have earned its way and could have supplied cheap electricity. Its financial return alone has to save the Corporation as a whole in what may be termed as the "short run". The Committee feel, however, that the construction of this unit ought not to have been given its present priority of construction. When floods continue to devastate, or crops dry up, it will be little solace to the poor peasant to get cheap electricity. But it is too late now to reverse the gear. The sooner this unit is completed the better. The Committee however suggest that it should be investigated by a body of experts whether the full value of money spent on this project has been obtained.

(ii) *Konar Project*: Detailed study and surveys have been completed, both topographic and geological. Drilling work of 3,000 sq. ft. was carried out. Designs were originally made by the French firm, Societe Des Batignolles, and radically modified by Messrs. Gruner Bros. of Basle, Switzerland. The construction of the dam has been entrusted to Messrs. Hind Construction Ltd., and Patel Engineering Co. Orders have been placed for the excavating and earth moving machinery. Messrs. Gruner Brothers have now been appointed as Consultans to supervise construction.

The Board of Consultants strongly urge a return to the central concrete spillway in the river channel as suggested by Mr. Voordouin as against an all-earth dam as proposed by Batignolles and further modifications proposed by Messrs. Gruner Bros. The Consultants further suggest "it is important now to authorise an intensive study of the best plan for developing the whole Konar river, for which six schemes have been proposed, only one of which would require the power house at Dam No. 1 as now contemplated. The ultimate scheme for developing the whole river should therefore be selected before committing finally to this power house". The Consultants do not expect the Konar Dam to be completed in time to provide cooling water to Bokaro thermal plant in the first stage. They have, therefore, recommended the immediate execution of a new project, the Upper Siwane Dam Project, at a cost of about Rs. 20 lakhs. The primary object of this project is to provide water for Bokaro Thermal Station as soon as possible, pending the completion of the Konar No. 1 project, and subsequently to conserve the waters of Upper Siwane for irrigation and drinking water for Hazaribagh.

The Konar river is more useful as an all-reason supplier of cooling water to the Bokaro Thermal Station. As a unit for flood control and irrigation supply its usefulness is far from being commensurate with an investment of Rs. 10 crores on this project. The construction of the dam actually on the bed of the Konar is progressing. The erection and consolidation of the earthen bunds on either side of the concrete work is also being completed. The actual construction of the dam is not a complicated process. Earthen bunds equally high and in some cases more than a mile long with only masonry spillways have been in existence in South India for centuries. The Konar Dam when full will not be larger than one or two of the big tanks in South India. Of course these reservoirs have no hydro-electric generating stations. Till now Rs. 7:2 lakhs have been paid to the Consultants, Messrs. Gruner Brothers. The Committee suggest that an expert body should study the question whether indigenous engineering talent would not have done the job at a lesser cost.

(iii) *Tilaiya Project*: Preliminary work like contour survey, borings, geological examination of dam site, hydraulic studies, soil studies, preparation of preliminary projects including designs and methods of construction, operation and construction of temporary camps has been finished. This was followed by completion of the final designs and calling for tenders from contractors. But as only one contractor came forward and quoted exorbitant rates, it was decided to construct the dam departmentally. Construction started on 6th October, 1949. Construction of camps and reclamation of land for settlement of displaced personnel are progressing. A power house of 1,400 k.w. capacity has been set up at the work site and it is providing power for construction of the dam and to the Mica Mines in Kodarma, etc.

The Board of Consultants are not in full agreement with the best methods of construction of the Tilaiya Dam. The Indian Consultant favours changing to conventional concrete construction mainly because he feels that concrete process or the similar American prepakt process is more or less experimental for a structure of this kind and believes that we should adhere to proven methods. Both the American Consultants are of the opinion that there has been ample experience with the prepakt method to ensure that concrete of high quality can be produced by the intrusion of grouting process. They believe that either method will give a satisfactory structure and that decision should be based on considerations of economy and time for completion. They further believe that this decision should be left with the Engineer-in-Charge after a study of the labour and equipment requirements for each method, and that change to concrete should not be made unless there is assurance that the required equipment can be delivered in time to enable the work to proceed without delay and that the date of completion will not be materially postponed.

Tilaiya is on the Barakar river. The dam is located within twenty miles of the source where the river takes its rise. This being so, the catchment area is very small, namely, 380 sq. miles. So its flood control capacity is very little. How much land it will finally be able to irrigate continuously can only be judged by actual results. It will generate hydro-electricity. In the beginning it will be a separate grid, with a capacity to generate 40,000 k.w. It is also proposed to have a stand-by generator provision. The need to have a stand-by generator is not satisfactorily explained. The D.V.C. Hydel stations will have to rely always on the Bokaro Thermal Station for a uniform peak load throughout the year. In these circumstances, keeping Tilaiya Hydel as a separate grid and having a stand-by arrangement seem to the Committee to be both extravagant and unnecessary. For any failure Bokaro will step in. The revised estimate of expenditure for this project is Rs. 1,95,66,000. The progress here, the Committee feel, is due to the fact that the work is being done departmentally and not through a contractor.

(iv) *Maithon and Panchet Hill Dams*: Preliminary investigations and surveys are proceeding. Construction of camp labour and staff quarters, access roads, etc. at the two dam sites has been taken in hand. The Corporation have constructed at 2500 k.w. Power House at Kumardhubi for providing power for construction of Maithon Dam and for Chittaranjan. A timber workshop started functioning from November 1949 and has been supplying the construction camps with furniture, doors and windows. Since January 1950, the Corporation's Soil Mechanic Laboratory has been located at Maithon and is fully equipped with modern soil-testing apparatus. A mechanical maintenance unit has also been engaged for assisting in the preparation of the designs of the Maithon Dam.

The Board of Consultants consider that the original design of earth dam core wall with concrete-filled cellur sheet piling foundation was impracticable of execution. They have offered various suggestions in their report and ended by saying "It is not possible to make an estimate of this revision nor to check former estimate until the diversion channel is explored, until which time, the earth dam cannot be designed."

It is said that the construction of the Panchet Hill Dam will submerge some lands and buildings of the Sindri Fertilizer Factory. The Committee called for reports from the Damodar Valley Corporation, the Central Public Works Department and the Ministry of Commerce and Industry. The Damodar Valley Corporation has reported that the designs of the Panchet Hill Dam are still in preliminary stage, that the present indications are that no permanent buildings would be submerged and that final designs would take care of such problems. Reports from the Central Public Works Department and the Ministry of Commerce and Industry have not been received so far.

These two dams are the main dams that will have to supply irrigation water and hold the Damodar flood under control. No construction has yet been undertaken in both these places. In the case of the Panchet Hill Dam much preliminary work has to be done. The revised estimates, etc. for the Maithon Dam are complete, and the construction work is expected to start shortly. It is not, however, known which agency is to construct the work and whether the terms are favourable or not.

The Committee also understood that at no stage the whole project was subjected to the scrutiny of the Board of Consultants and that only queries about certain moot or doubtful points were put and answers secured. This appears to be a curious procedure and the Consultants cannot be expected to give general and wholesome advice. These two dams are conceived in a big manner but the capacity of both of them put together is only half of the Mettur reservoir in South India. Large establishments and consulting firms are eating away a good deal of finances without even the foundation stone being laid. Perhaps the delay in appointing a Chief Engineer has been mainly responsible for this delay and the expensive way the project is being run.

Durgapore Barrage

41. These two dams and the Durgapore Barrage, etc. which will distribute water, are estimated to cost Rs. 4,11,39,000 under drainage. This amount includes Rs. 2,22,28,000 under navigation and Rs. 1,89,11,000 under drainage, and will be needed in a short period of 3 to 4 years. Firstly, it is not known whether the Government is prepared to make this amount available. Secondly, whether one of the dams (Maithon) may be constructed first—whether one dam or

two dams are constructed—the Durgapore Barrage and the Distribution system must be undertaken simultaneously.

It has been established that the floods in the Damodar have been causing greater havoc as years have rolled by because the bed of the river has been getting silted up year after year. Even if a single dam were constructed at Maithon, the flow of clear water in non-flood months may erode the bed of the river to some extent and thus reduce the quantum of flood havoc considerably. This is an additional reason why the construction work of the Maithon should be started immediately.

Reclamation and rehabilitation

42. The schemes for reclamation and rehabilitation seem to be a costly enterprise. The average cost of reclamation for one acre of that is said to be Rs. 480. The Committee have reasons to doubt that this is not the actual figure and the actual cost per acre would be much higher than this. The cost of rehabilitating displaced persons also seems to be high. If grants of money, sites for residential quarters and fields for cultivation are given, the arrangement will be less costly and the displaced persons will enjoy better living. This matter should be investigated immediately by the Committee which is appointed to investigate the matters referred to in para. 28 above.

Organisational defects

43. It is abundantly clear that when the Damodar Valley Scheme was sanctioned the plans and estimates were drawn up very roughly. The matters become worse if it is assumed that at the time the Scheme was sanctioned all the details were known and they were reasonably complete; but when the Scheme was actually started it has been subjected to constant changes under the stress of too much consultation and advice. Even at this stage there seems to be no finality about the matter and things are in a very fluid stage and are subject to further modification and changes as and when further consultations take place. It is also clear that during these three years that the Corporation has been in existence the Scheme has not gone beyond the elementary stages. The progress reports show that till recently no more than camp constructions, call for tenders, marking of sites, etc., had been done. It is only during the last few months since the appointment of the present Chief Engineer that the main work on the construction of dams has started and there are indications that if things proceed at the present rate all the works may be completed in time. The Committee, however, regret to observe that due to bad organization and laxity of control much valuable time was lost and the construction delayed. They hope that proper vigilance will be kept so that the construction of the various dams and power-generating plants proceed according to schedule.

T. V. A. Model

44. It was stated before the Committee that although the D.V.C. was patterned on the model of the T.V.A. none of its essential features had been incorporated in the Corporation. The only similarity between the two is that they are autonomous in character. Like the T.V.A., the D.V.C. is administered by a Board consisting of a Chairman and two members. The Chairman of the Corporation is a member of the Civil Service lent to the Corporation by the Government of India. Of the two members, one is a legislator and the other a food technologist. One should have expected specialist engineers or financial experts on the Board but instead there are non-technical persons who have to be guided in their decisions by the advice given to them by their subordinate technical staff. In the first set-up of the T.V.A., President Roosevelt's first appointee, Arthur E. Morgan, was an engineer, who gave shape to T.V.A.'s character in a manner seemingly consistent with the spirit in which the new enterprise was launched. The D.V.C. has followed the form but lost the spirit.

The T. V. A. in America achieved spectacular progress. Billions of dollars were invested into that project. In India there is no lack of enthusiasm but the country's financial resources are so limited that during the whole three-year period that has elapsed since the inauguration of the first river valley development authority we feel strained for finances. In the case of T. V. A. for the fiscal year 1947 power operation represented about 57 per cent. of its activities while operations of chemical plants mainly for producing fertilisers was next with 26 per cent. These two activities accounted for over 83 per cent. of the total investment. About half of the remainder, namely 7 per cent, was spent on various development schemes, agriculture, forestry, mineral and the like; navigation and flood control accounted for 4 per cent each.

The Committee find on comparison of the D. V. C. with the T. V. A. on the same basis that its present achievement is not much in any of its activities. None of its power-generating plants, hydro-electric or thermal, is yet working. Except for one or two bunds near Gauriya Kurma which has helped the cultivation of a few acres of land the D. V. C. has not yet supplied water to any land, new or old. Even according to the revised programme of the D.V.C. power-generating activity will not commence for another 12 or 18 months.

Position of the Financial Adviser

45. The statutory rules of the Corporation lay down that no proposal whatever involving revenue or expenditure can be sanctioned without the advice of the Financial Adviser. His advice is recorded. If there is disagreement with the advice of the Financial

Adviser, the matter has to go to the Corporation. Since the Financial Adviser has no right to vote, he can be overruled by the Corporation. Though he is appointed by the Government for all practical purposes he comes under the Administrative control of the Corporation. The Comptroller and Auditor General has reported that as the Financial Adviser is subordinate to the Corporation there is great difficulty in the financial control being exercised. On the 9th May 1949, at the Conference between the representatives of the Corporation and the Governments of West Bengal and Bihar it was suggested that in the event of a difference of opinion between the Financial Adviser and the Corporation the matters should be reported to the Government of India. The Corporation were against it, as they thought that it would be setting up their Financial Adviser against the Corporation. It was therefore decided not to pursue the question or issue a directive under Section 48 of the D.V.C. Act.

It was however stated in Parliament on the 26th May, 1951, in answer to a question, that a convention had recently been set up that whenever there was a difference of opinion between the Financial Adviser and the Corporation, the former should refer the matter to the Government of India under intimation to D. V. C. and ask for a decision. Although in the circumstances, the need for the establishment of such a convention may be desirable as an interim measure until the entire organizational set up of D. V. C. was reviewed, there is no doubt that such a procedure is far from satisfactory both from the point of efficiency and promptitude in the execution of work on the spot. This compromise is likely to lead to more difficulties and considerable delays in arriving at various decisions.

Illogical set-up

46. The Committee feel that the present administrative and financial set-up of the Corporation is most imperfect, illogical and open to criticism. It is unfortunate that the set-up of the Corporation was not conceived in the manner in which it ought to be. In a Corporation of this character the Engineer and the Financial expert should be so knit together that they have an authoritative voice in the framing of decisions on behalf of the Corporation. It would have been more appropriate and conducive to efficiency if the Corporation consisted of a qualified engineer, a financial expert besides an administrator. The position of the Financial Adviser or the Engineer who are the main props, has been relegated to the background and there are no means whereby it can be ensured that their advice is a determining factor in the decisions of the Corporation. One of the serious drawbacks in the set-up of the Corporation according to the Committee is the absence of an engineer and a financial expert on the Board of the Corporation. The Committee strongly recommend the reconstitution of the Board in accordance with the recommendations made in Chapter VII.

Chief Engineer

47. The Committee noted with surprise that till recently the Corporation did not think it necessary that there should be a Chief Engineer in overall control of the project as a whole. They also noted with regret that whereas the Government of India had appointed one Chief Engineer on the 23rd March, 1948, the Damodar Valley Corporation soon after it came into being in July 1949 decided to dispense with his services, as they were doubtful whether it was at all necessary to have one Chief Engineer in overall control of the project. Later, on the 9th May 1949 at the Conference between the representatives of the D. V. C. and the participating Governments the question of the appointment of a Chief Engineer was again raised. It was stated that the D. V. C. proposed to employ an American Chief Engineer and that the Chairman of the T. V. A. was trying to secure the services of a suitable Chief Engineer. Subsequently, however, the Corporation appears to have given up the idea of recruiting a Chief Engineer from abroad, presumably on the ground of high salary which was being demanded by the likely candidates. Efforts were then made to secure the services of some Indian Chief Engineer. None of the Indians was, however, found to be suitable for the post either because the Government concerned would not agree to release him or because he himself was not prepared to accept the appointment. The D. V. C. then under their own powers selected an American Chief Engineer—Mr. Andrew M. Komora—for the post of Chief Engineer on the recommendation of the Chairman and the Chief Engineer, T. V. A. and Mr. L. F. Harza of Messrs. Harza Engineering Co., U.S.A. The terms and conditions on which the Corporation have appointed Mr. Komora are given below:

(i) Salary: $25,000 per annum subject to Indian income-tax and payable in U.S.A. currency, plus reimbursement of excess, if any, of the Indian income-tax over the U.S tax.

(ii) Free passage either by air or sea for self and family both ways.

(iii) Corporation will provide free furnished house, transport, medical service, two peons and for travel on duty in India, travel and other allowance permissible to first class officers.

(iv) Period of appointment—3 years.

48. It appears that the Government of India were not consulted in this matter nor informed of the appointment of Mr. Komora as Chief Engineer to the Damodar Valley Corporation. Incidentally in connection with the question of the foreign exchange involved in this proposal a reference was made to the Government of India. By

this time, the appointment had however been made and the Government of India had no option but to allow Mr. Komora to take up the job.

49. The Committee have the following comments to make in this connection:

(i) It was an unwise act to dispense with the services of a Chief Engineer who was already in position on the plea that none was required. It is most difficult to visualise that a project of such a big magnitude could be controlled and executed without a Chief Engineer being in overall control of all the works and responsible for overall technical advice. The Damodar Valley Corporation, themselves realizing the mistake, thought, albeit belatedly, that the appointment of a Chief Engineer was almost a necessity. It is significant to note that the Board of Consultants in their report of August, 1950 to the Damodar Valley Corporation made the following observations:

"46. The position of Chief Engineer at this stage of development of the project is one of greatest importance. On him will depend in large measures the progress of the work and the successful completion of the project. With the large responsibilities he assumes must go complete and undivided authority over the engineering and construction organization."

(ii) The Corporation have deemed it necessary to appoint a non-Indian to the post when no serious attempt seems to have been made to find a suitable Indian for the job. When questioned on the subject, the Chairman of the Corporation pleaded before the Committee that the selection was restricted to very few candidates, two or three, who had been recommended by the Chairman, Central Water Power Irrigation and Navigation Commission. He also deposed that the Corporation did not interview all the candidates. One engineer who was interviewed by one of the members of the Corporation casually was declared unsuitable, as in the opinion of that member the engineer was too old for the post. One or two other candidates who were likely to accept the post were rejected mainly because their terms were a little higher than what the Corporation proposed to give, though however, it is highly doubtful that the terms demanded by them were anywhere near those offered by the Corporation to the Chief Engineer appointed by them from the United States of America.

50. It should be understood clearly that the Committee have no objection to a foreigner being appointed as an engineer if a suitable Indian with the requisite technical knowledge and experience is not available and it is in the public interest to obtain the services of a qualified engineer from abroad. But they think that the procedure adopted by the D. V. C. for making a selection of a suitable Indian for the job was defective and they are of opinion that the methods for tapping available technical manpower in India should be improved and clearly laid down.

51. The Committee note that the appointment of the present Chief Engineer is only for a period of three years. It is, therefore, essential that in order that after his term of appointment concludes a responsible Indian engineer may take over from him a competent person should be placed as under-study to the present Chief Engineer so that he is fully equipped with all the technical administrative experience by the time he is called upon to take over the charge of Chief Engineer, and the selection of such a person should be entrusted to a Committee of Experts of which the present Chief Engineer should be the Chairman.

52. The Committee considered that whereas the Corporation have failed in carrying out their duties within the delegated authority the Government of India have equally failed to take timely action in putting right the matter. They could have issued directions to the Corporation under Section 48 of the Damodar Valley Corporation Act; but there is no evidence on record to show that they used their power to put right the obvious defects. The failure on the part of Government cannot be too severely criticised.

Advisory Committee

53. The Damodar Valley Corporation came into existence on the 7th July, 1948. By April, 1949, the three participating Governments had begun to feel that they had not been adequately kept informed of the progress of various activities of the Corporation. The Governments of West Bengal and Bihar thought that an Advisory Committee should be appointed to keep in touch with the affairs of the Corporation. A resolution was also passed in the Bihar Legislature for the early appointment of an Advisory Committee. At the Conference held on the 9th May, 1949 between the representatives of the Damodar Valley Corporation and the Governments of West Bengal and Bihar it was considered necessary to devise some machinery whereby the participating Governments could remain in close touch with the affairs of the Corporation. It was thought that that object would be achieved if the Corporation sent to the Government concerned the copies of the agenda and proceedings of all their meetings or by holding quarterly meetings between the Corporation and the representatives of the participating Governments. The

Corporation considered it impracticable to send agenda papers and proceedings on the ground that if they were required to send these documents to the Governments concerned it would be an infringement of their autonomy. After some discussion, however, it was decided that in order to bring together the various units concerned, the Damodar Valley Corporation would set up an Advisory Committee consisting of the representatives of the three participating Governments. This instance is sufficient to show the strange conception of the autonomy which the Corporation have been trying to develop. It is also quite clear that from the very beginning the Corporation have been trying to escape the obligation of submitting a report on their work and keeping the participating Governments informed of the progress of their activities and affairs.

Conflicting advice and variable estimates

54. The Committee have not been shown any papers regarding the initial plans and estimates of expenditure in connection with the Damodar Valley Projects. It appears that a very rough plan was made and a very rough estimate was drawn up when it was decided to take up this project in 1945. During the six years that have passed since the plans and estimates were drawn up, there does not seem to have been any effort on the part of the Government or the Corporation to make final overall plans of the work and arrive at the revised estimates of expenditure in keeping with the revised plans and the current economic conditions. The whole work has been kept in a fluid state and each part of the project is taken up piecemeal. There is no coordination nor overall control of the various schemes under the control of the Damodar Valley Corporation. The result is that the original estimates have become out of date and the original plans blurred by constantly changing them to suit exigencies of the moment. There are a number of Technical Advisers to the Corporation and their advice is conflicting with the result that the Corporation has to change and very their plans from time to time and incur expenditure not originally conceived.

Financial forecast

55. The D. V. C. has made the following financial forecast:

	Rs.
Capital Investment	74,98,40,000
Gross Revenue	5,84,23,000
Working expenses	1,71,37,000
Net Revenue	4,12,86,000

The net revenue worked with reference to the capital outlay yields at the rate of.

(a) 5:5 per cent P,A. including interest during construction.
(b) 4:9 per cent P.A. including interest during construction.
(c) 5.89 per cent P.A. as on (b) but excluding the capital and interest on investment on Flood Control.

These figures are rosy but everything is contingent upon the fulfilment of a certain progress, timely investment according to schedule and the income as anticipated. There are apparent catches in these three things and the results cannot be expected to flow as stated above. The Committee, therefore, recommended a thorough investigation to arrive at as near a correct figure as possible.

Plea of lack of finance

56. It appears that the Corporation pleaded that the slow progress of work is due to shortage of hard currency and the deepening economic crisis which compelled them to give up the original idea of executing the whole Scheme with the utmost speed so as to keep down the costs to the minimum. The Committee understand that the Corporation have always been kept well-supplied with funds and that the actual contribution by the participating Governments amounted to Rs. 15,38,48,800 up to the 31st March, 1951. It is therefore unfair to say that the slow progress was due to shortage of hard currency and the deepening economic crisis. It has also been brought to the notice of the Committee that the loan sanctioned by the International Bank of Reconstruction and Development which covers all the hard currency requirements of the Bokaro Thermal Station is exclusively available for the Damodar Valley Project. The Committee do not accept the view of the Corporation that the progress of the work was slow because of want of funds. On the contrary they feel that the reasons for the slow progress are obviously due to the many defects pointed out above such as the absence of a competent Chief Engineer with complete and undivided authority over the engineering and construction organisations and the proper administrative and financial set-up of the Corporation.

Emphasis on Thermal Station

57. The Corporation in the first phase of the project seem to have given preference to the generation of electricity, and flood control and irrigation measures were relegated to the background. The Scheme was originally conceived as a flood control measure but the Corporation have thought it fit to concentrate attention on the Thermal Station. There is an urgent need for the supply of water to unirrigated tracts of land and effective steps should have been taken to complete the barrage. The Committee note with consent, that the Central Government should have overlooked the country's need in the matter of food and agricultural produce and given their attention to a secondary matter, namely, the erection of a thermal station. The Committee feel that the work of flood control and irrigation could have been completed at a far less cost than that incurred on the Thermal Station and the results would have been more useful for the country's benefit.

Location of the headquarters office

58. In October, 1948 the Corporation decided to set up their headquarters office at Ranchi having headquarters at suitable places in the Upper and Lower Valley and camp offices at the sites of the projects under construction. Accordingly, steps were taken to organise a Headquarters Construction Division. After investigating several sites, a site was acquired in the vicinity of Ranchi. Construction materials were also collected to some extent with a view to starting construction of buildings at an early date. It is said that in view of the economy drive, work on headquarters construction was almost suspended and consequently the headquarters office of the Corporation continued to be located at Calcutta. Meanwhile, the Planning and Designing Division at Ranchi, Land Classification and Soil Conservation Division at Hazaribagh and the camp offices at Tilaiya, Konar, Maithon and Bokaro have been allowed to remain at these different places. The nearest dam is about 150 miles from Calcutta and the farthest dam would be about 225 miles. The Committee do not see any justification for continuing to keep the headquarters office at Calcutta and not locating it where the construction is going on. This shows that the Corporation are not taking any direct deep interest in the progress of work at the various sites or a lot of expenditure is incurred on touring from head quarters to the various sites every now and then for inspection purposes. As no reasons have been given for the separation of the headquarters office from the camp offices, the obvious conclusion is that the Corporation is not in intimate touch with the work on the spot. The result is that overall coordination of the various projects is far from satisfactory.

Purchases

59. It has been stated that the Damodar Valley Corporation have placed orders for about seventeen crores of rupees, the major portion being for Power House construction equipment. Of these eight crores of rupees related to orders placed with the International General Electric Company for the Bokaro Power House. The India Supply Mission, Washington, are the agency who make payment and arrange shipment, etc. in the U.S.A. Out of these purchases made by the Damodar Valley Corporation 66 per cent have been made in the open market and about 33 per cent, through the Director-General of Supplies. The Damodar Valley Corporation do not indent on the Director-General of Supplies on items of highly specialised character like the electrical equipment for which, it is stated, the Director-General of Supplies has no inspection facilities abroad. All electrical equipment is ordered under the advice of the Central Electricity Commission and the Damodar Valley Corporation operate on rates contract. The Damodar Valley Corporation do not place indents on Director-General of Supplies for items costing less than Rs. 50,000. When materials are needed within six months, the D.V.C.

purchase them direct. The Committee are unable to understand why in the face of a Government organisation like the D.G., Supplies and the two big Purchase Missions abroad, namely, the India Store Department, London and the India Supply Mission, Washington, the D. V. C. should have been given power to arrange for supplies themselves without the aid of these organisations. It was stated in Parliament that one reason why the Damodar Valley Corporation did not place their indents on D.G., Supplies was that they were not able to get the goods in time. If this criticism is correct, then the Government purchasing organisation is too inept for these functions. This is an additional reason, for accepting the recommendations of the Committee made in para. 56 (b) of their First Report on the Ministry of Industry and Supply for replacing the Government purchase machinery by a Purchase Corporation to whom all these functions could be assigned. The Committee are not, however, clear about the charge of delay made by the D.V.C. against D.G., Supplies, as from the statements made before them it appears that the D.V.C. did not utilise the purchase organisations to the full and consequently the charge of delay against them may be exaggerated. In any case the Committee consider that some machinery should be devised whereby there is complete liaison between the Purchase Missions and the D. V. C. so that their requirements are supplied in time.

Inspection

60. The Corporation are paying a commission on the basis of 2½ per cent to the Consulting Engineers in America to carry out the inspection of equipment abroad. The Corporation could have saved substantial amounts if they had entrusted the work of purchase and inspection to the Indian Purchase Missions abroad. It is also doubtful whether the articles supplied correspond to quality, as we have none of our men to inspect and certify this.

One agency for different functions

61. A practice has developed whereby the Corporation have employed some of their Consultants as contractors for the execution of work or for the supply of stores or even used them as an agency for inspection of stores supplied by some other firm. This in the opinion of the Committee is undesirable. It is unsound to entrust the work of designing a project and construction to the same agency. It is equally dangerous to ask the same agency or associate agency to act as inspecting agents of the Corporation for the supply of stroes by them or by its corporate firm. These are serious defects and the Committee feel that they should be removed forthwith.

Schedule of rates

62. The Comptroller and Auditor General of India has drawn attention to the fact that no schedule of rates is maintained by the

Corporation for giving contracts. On the 21st February, 1951, when this question was raised in Parliament the Minister for Natural Resources and Scientific Research admitted that the D.V.C. had kept no proper schedule of rates but he assured the House that efforts were being made to prepare the rate schedule in conformity with the rate schedule of Central Public Works Department. The Committee are not aware whether this has since been done but would like to emphasise that if this has not already been done it should be given immediate attention.

Contracts

63. In the Annual Report of the Corporation for 1949-50 the Auditor has stated that according to the present practice of the Corporation contracts are given by negotiation without competitive tenders being called for. This is a serious criticism against a Statutory Body and should be rectified at once. It is of the utmost importance that proper rules should be laid down for giving contracts and that those rules should be strictly adhered to. The confidence of the tax-payer is shaken when such arbitrary procedures are followed which are open to corruption, fraud and irregularities. It is unfortunate that Government should not have taken note of these drawbacks in the procedure adopted by the D.V.C. and issued directions in time. The Minister for Natural Resources and Scientific Research has, however, recently given an assurance in Parliament that before he came forward for sanction for capital expenditure in the next budget session he would take due note of the remarks of the Auditor and improve matters accordingly.

64. The Committee view with concren that if proper steps are not taken to rectify the many defects in the organisation of the Damodar Valley Corporation the projects may prove uneconomical and eventually may be a drain on the country's resources rather than beneficent as anticipated. Bold action is required which would give the organisation a new life and make it capable of producing the maximum within the minimum cost and time. The Committee would strongly urge that immediate action should be taken to put right matters in the light of the criticism made above and the recommendations made in Chapter VII.

IV

HIRAKUD PROJECT

65. The scheme for the unified development of the Mahanadi Valley comprising the construction of three dams at Hirakud, Tikarpara and Naraj is designed to control, conserve and utilise the waters of the Mahanadi river for purposes of irrigation, hydro-power generation, navigation, flood control and other facilities such as fish culture, malaria control, soil conservation, recreation, etc. As a first step to achieve these objectives, the construction of the Hirakud Dam has been undertaken.

The Project

The project comprises the construction of a dam across the river Mahanadi about 9 miles upstream of the town of Sambalpur, four irrigation canals, two on either side of the river, a subsidiary dam 20 miles below the main dam, two hydro-electric installations, one at the main dam and the other at the subsidiary dam, and a power channel and navigation locks. It provides for irrigation of nearly 1.1 million acres of land, mostly in the Sambalpur district of Orissa, Out of this more than half will be irrigated by flow and the rest by lift. Two power Houses proposed to be constructed on the Hirakud Dam Project with an installed capacity of 320,000 k.w. will be able to supply a primary power of 218,000 k.w. This power is proposed to be transmitted to Cuttack, the Madhya Pradesh and Jamshedur and later on linked to Machkund Power Station. Part of the capacity of the reservoir at Hirakud will be reserved for flood regulation so that peak flood flows can be stored in the reservoir. This is likely to result in an annual saving of 12,00,000 of rupees in flood control in the delta, reclamation of flooded lands and increase in food crops as a result of such reclamations through flood protection.

The period within which the whole project is expected to be completed is 7 years. The Committee were told that it was programmed to complete the lower power house and the power channel by the end of 1952, by which time they expected to get the first unit for installation there. By the end of 1952-53, hydro-electric power would be available from the lower power house and the upper power house would be completed by 1954.

Estimates

66. The original estimate based on the 1946 rates was Rs. 47·8 crores. The revised estimate comes to about Rs. 89.09 crores. The increase in the estimate has been attributed to (i) increase in the scope of the project, that is, increase in the annual irrigation area

from 10.95 lakhs to 19.28 lakh acres and (ii) the general rise in rates since 1946 including devaluation of the rupee. This is a scheme of the Orissa State, but is financed from the loans advanced by the Central Government for this purpose to the State Government.

The actual expenditure incurred during the years 1948-49 and 1949-50 work out respectively to Rs. 50.87,200 and 5,94,00,000. The budget estimate for 1950-51 was at Rs. 10.41 crores, but Government restricted it to Rs. 3.9 crores, the details of which have not been given.

Administrative set-up

67. The construction of the project is under the charge of a Chief Engineer appointed by the Central Water and Power Commission and all technical and financial sanctions are accorded by the Government of India. The Government of India have appointed a whole-time Financial Adviser and Chief Accounts Officer for the project. He is stationed at Hirakud. The Chief Engineer has under him three Superintending Engineers, one in the charge or Hirakud Dam Circle, the second in charge of Mahanadi Canal Circle and the third in charge of Electrical Circle. These three Superintending Engineers are assisted by subordinate officers and non-gazetted staff aggregating 681.

Development and Contract Board

68. To provide an effective liaison between the Central and State Governments and the officers in charge of the project, a Development Board and a Contract Board have been set up. The Development Board consists of—

1. Chief Minister of Orissa (*Chairman*).
2. Chairman, Central Water Power Irrigation and Navigation Commission.
3. Chief Engineer, Hirakud Dam Project.
4. Commissioner, Northern Division.
5. Chief Engineer, Orissa P. W. D. (Electricity Branch).
6. Chief Engineer, Orissa P.W.D. (Irrigation Division).
7. Director of Industries, Orissa State, and
8. Financial Adviser and Chief Accounts Officer, Hirakud Dam Project.

The Board advises on all matters relating to the development part of the project, land acquisition and resettlement of displaced people. The Contract Board consists of—

1. Chief Minister of Orissa (*Chairman*).
2. Chairman, Central Water Power Irrigation and Navigation Commission.

3. Chief Engineer, Hirakud Dam Project, and
4. Financial Adviser and Chief Accounts Officer, Hirakud Dam Project.

This Board deals with all matters relating to contracts for the project.

Progress

69. (i) Investigations for the project were undertaken in April 1946. By June 1947 sufficient data was available to enable the Scheme to be designed and submitted to Government. Construction work was started on the 27th May, 1948.

(ii) A field Research Laboratory has been established at the dam site. Research on silt and soil analysis is in progress.

(iii) A start has been made on the acquisition of land for canals.

(iv) The work on buildings, access roads and railway tracks is in full swing.

(v) In October 1948, the construction of a combined rail-road bridge over the Mahanadi near the Hirakud Dam was entrusted to the Hirakud Dam organisation by the Railway Board as the bridge was considered absolutely necessary for transport of material from Sambalpur to the right bank of the river. It consists of 25 spans of 18 feet each with reinforced concrete arch ribs carrying the decking on top. The work was started in November 1948 and has been completed.

(vi) A diesel power station for meeting the power requirements during construction with a capacity of 1165 k.w. has been set up. Two additional sets of 500 k.w. each are on order. In addition two small houses with 2 diesel sets of 50 k.w. have been erected for the running of machine shops.

(vii) A fully equipped machine shop and a repair shop for light and heavy vehicles and earth-moving machinery have been erected and are in commission. Various requirements of the projects on the mechanical side are being manufactured in these two shops. The electrical shop has also been added.

(viii) Most of the earth-moving machinery has been received and put into operation. A lot of machinery from disposals has also been purchased. The detailed designs for the dam, both concrete and earthen, has been finalised and the drawings have been received from the U.S.A. Excavation of foundations for the concrete portion of the dam was started in 1949 and is in progress in a length of 2,200 ft. from the left bank. 1.5 lakhs cubic feet of earth and 22.7 lakhs cubic feet of disintegrated and fresh rock have been removed from the foundation after excavation and blasting.

(ix) Excavation of foundation has been taken up in Hirakud island and 125 lakhs cubic feet earth-work have been done so far. About 91 lakhs cubic feet of earthwork have been done in the dykes. 11 lakhs cubic feet of rubble have been collected.

(x) *Power Channels*; 1,50,04,000 cubic feet of earth work have been done. 3 lakhs cubic feet of concreting have been done on the rail-road bridge.

(xi) *Hydro-electric plant*: Detalied specifications for hydro-electric plant for Power House No. 2 were prepared last year and tenders for turbines and generators invited. Orders have been placed. Survey and designs of transmission lines are in progress.

Defects in the administrative set-up

70. The administrative set-up for the construction of the project has been so devised as to make it a subordinate office of the Government of India. The inherent difficulties in this arrangement are present in all their aspects in this case. Transfers of engineers take place frequently from the organisation to other offices of the Government of India and new engineers are brought from other places. The Committee understand that there were as many as five cases of transfer of the Chief Engineer and the Superintending Engineers from the Hirakud Project. The reasons for the transfers of the Superintending Engineers are stated to be on grounds of health or differences with the Chief Engineer. The Chief Engineer was transferred on account of unsatisfactory engineering work and mal-administration. The Committee recommend that in order to ensure continuity of administrative policy or executive action such frequent transfers should be avoided and officers of proved ability and amenability to discipline should be put in charge of such important works. Then, the Chief Engineer has certain delegated powers just as any other Chief Engineer under the Central Government has. These powers are very limited and the persons in charge of the construction of such huge works cannot be expected to carry on their work satisfactorily if they have to come up to the Central Government for small technical sanctions. The authority at the Centre consists largely of non-technical staff who do not usually understand the urgency of certain matters at the moment and take their own time to arrive at decisions and convey sanctions. This upsets the whole planning and programme of execution. A large measure of authority should necessarily be delegated to the man on the spot and for that purpose there should be a proper organisation to whom such power can be delegated. The Committee have recommended in paras. 4 and 5 the model set-up for the administration and construction of such projects. It is hoped that the Hirakud organisation will also be modelled on that pattern to avoid the difficulties mentioned above.

Financial Adviser

71. The Committee note that a Financial Adviser of the rank of the Deputy Secretary to the Government of India has been posted to the organisation to accord financial sanctions. The Financial Adviser works within the powers delegated to him. On all other matters he has to refer to the Government of India for their approval. This is obviously an unsatisfactory arrangement which inevitably leads to great delay and waste of time and expenditure. It is necessary that Financial Adviser of a sufficient seniority and with sufficient authority, and having a large measure of discretion to give decisions on the spot should be posted to these organisations. The position of the Financial Adviser should be defined in the manner recommended by the Committee in paragraph 105.

Appointment of technical men on non-technical jobs

72. The Committee find that P.As. in the rank of an Executive Engineer or an Assistant Engineer are sanctioned for higher categories of Engineers to look after office work. The Committee consider that this is a waste of talented manpower on a comparatively non-technical job. The technical men as far as possible should be put on technical side of the work and office work could as well be attended to by ordinary administrative personnel. Government should review the whole organisation in the light of this observation and replace the technical men by administrative service personnel wherever the former are performing office or administrative work as distinguished from the technical work.

Plans of industrial development

73. It is observed that the electric power would be produced at an enormous rate when the Hirakud Project is completed. The question of development of industries for which the power will be utilised in the area is still under consideration. The Committee were told that the question of development of industries was being considered by the Orissa Government in consultation with the Ministry of Industry and Supply. The Ministry of Natural Resources and Scientific Research who were concerned with the construction of the project were not aware of the progress in the matter, but they thought that the plans were still in the elementary stages. There was no evidence that the progress of the plans for the industrial development was keeping pace with construction of the project. There seems to be no coordination in this matter. Each wing of the administration is pursuing it own portion of work without keeping in touch with others. This is detrimental to the whole development programme and economic welfare for which the projects are being constructed. The Committee have suggested in paragraph 5 how integration of all the elements in the scheme should be achieved and how an overall authority for the coordination of these various elements should be set up and organised.

Progress Reports

74. The Committee were not shown any project report by the Hirakud organisation showing the progress of the work from time to time. It is essential that there should be a proper system for preparing project reports on the progress of work and submitting them to the controlling authority so that that authority keeps in touch with the progress and plans ahead for the next stage. It is necessary that a system of preparation of monthly progress reports should be recast so that there is an even flow of funds and both that the progress shown in these reports is keeping in line with the plans, the schedule of dates and the estimated costs.

Preparation of revised estimates

75. The Committee would urge that the revised estimates should be prepared in detail in the light of the current information and the programme of expenditure to be incurred each year towards the execution of the project as spread over a number of years should be instituted and the controlling authority should ensure the Central and the Orissa State Governments are in the know of the current position. The representative of the Ministry of Finance told the Committee that the expenditure incurred on the execution of this project each year was debitable to the Orissa Government as loan advanced to them for that year which they would repay over a period of twenty years starting from the date of the completion of the project. Since the amount is to be debitable to the Orissa Government, it is all the more necessary that the course of preparing revised estimates as and when it became necessary to do so should be adopted so that any difficulties that might arise in regard to financial adjustment of the amount involved between the Central and the State Governments are removed.

Interest charges

76. The Committee were told that the rate of interest to be charged to the Orissa Government might vary anywhere between 3¼ to 3½ per cent. the interest being payable from the time the money was invested by the Central Government. Apart from the fact that it is in the national interest that the project should be completed by the scheduled date, it is of the utmost importance that the programme of construction should be adhered to strictly as any delay in the execution of the Scheme would mean that the Orissa Government would be liable for a larger amount of interest.

Construction Allowance

77. The Committee were told that residential quarters for Officers, Ministerial and Class IV staff had been constructed in the

vicinity of the Hirakud Dam Project at a cost of nearly Rs. 1 crore. It was stated that the employees occupying these residential quarters were not paying any rent. It was further stated that it was the practice to provide free accommodation to employees in out of the way places. The employees were also provided free lighting and water supply. In addition, the staff was in receipt of construction allowance at 20 per cent of pay subject to a maximum of Rs. 15 p.m. on account of the high cost of living in an out of the way locality and loss of amenities. The Committee feel that Orissa is a comparatively cheap place. This factor coupled with the grant of rent-free quarters and free supply of water and electricity affords adequate relief to such staff for loss of the so-called amenities. The Committee, therefore, recommend that the payment of the Construction Allowance which amounts to about Rs. 3.7 lakhs annually should be discontinued.

Contracts

78. The Committee, understand that a list of approved contractors is maintained by the Chief Engineer, Hirakud Dam Project and this list is approved by the Contract Board which consists of the Chief Engineer of Orissa, Chairman of the Central Water and Power Commission, the Chief Engineer and the Financial Adviser. The actual tenders are, however, given by the Chief Engineer from time to time. The Committee consider that all contracts should not be given by the Chief Engineer himself. The powers of the Chief Engineer in granting contracts should be restricted to certain monetary limits over and above which the sanction of the Board should be obtained. Similarly the powers of the officers below the Chief Engineer should be defined in this respect so that the system is fool-proof against any loopholes. The Committee consider that the Superintending Engineer should sanction contracts up to Rs. 50,000 and the Chief Engineer between Rs. 50,000 and Rs. 2,00,000. All works costing more than Rs. 2 lakhs should be given out on contract after approval by the Board.

Staff: Officers

79. The Committee find that the Government of India have recently sanctioned the posts of Executive Engineer and Personal Assistant in the rank of Assistant Engineer to the Executive Engineer for the custody of machinery for the Hirakud Dam Project. Further six posts of S. D. Os. and a large number of subordinate staff have also been created for this work. The creation of these posts involves an expenditure of Rs. 1.25 lakhs during the year 1950-51. The Committee do not find adequate reason for sanctioning the post of a gazetted Personal Assistant in the rank of Assistant Engineer to be attached to the Executive Engineer merely to look after the custody of the machinery. The other staff also seems to have been sanctioned on a liberal scale. The Committee do not know

on what basis these posts are sanctioned. The Committee suggest that all posts should be created after approval by an Appointment Board consisting of the Chief Minister of Orissa Government, Financial Adviser, Chief Engineer, Hirakud and the Chairman of the Central Water and Power Commission. Before a post is sanctioned, the Board should call complete data and examine the volume of work involved therein carefully. The reasons for the creation of each post should be recorded in writing and the financial effects worked out in advance.

Staff: Ministerial

80. The office establishment of the Chief Engineer's office at Hirakud also seems to be overstaffed. The Committee do not know whether any scales of work have been prescribed for each post in the offices of the Chief Engineers, Superintending Engineers, Executive Engineers, etc., at Hirakud. If this has not already been done they suggest that the Appointment Board referred to in the preceding paragraph for the appointment of persons to various posts should immediately go through the whole organisation and fix the number of staff required in each grade after laying down scales of work for the posts in question.

BHAKRA NANGAL PROJECT

81. The Bhakra-Nangal Project consists of (a) the Nangal Power Project (b) the Bhakra Canals and (c) the Bhakra Dam. The Bhakra-Nangal Project is an old one, being first conceived in 1908. In 1919 some preliminary investigation work was done but it was not until 1946 that the actual work was undertaken by the undivided Government of Punjab. Up to the time of Partition in 1947 that Government was financing it. The work on the project was interrupted due to Partition and it is only since 1948 that the work has been continuing. The Government of India is now financing the Scheme. The Bhakra Dam will be on the river Sutlej just at the point where it crosses the gorge of the Siwaliks Range and enters the Gangetic plain. The dam will be 680 ft. high and it will be the highest straight gravity dam in the world. About 8 miles down stream, there will be another dam on the Sutlej at Nangal. It will be a multi-purpose project irrigating 6·6 million acres of land and generating over 4 lakhs k.w. of electric energy. There will be two power plants, one on the left abutment of the canyon and the other on the right abutment down the Bhakra Dam. There will be three more power houses down the Nangal Dam all on the left abutment. The Nangal Dam will feed the Nangal Hydel Canal on which the three power stations will be situated. The Bhakra irrigation will spread out its arteries into the districts of Jullundur, Ludhiana, Ferozepur, Karnal and Hissar of Punjab State and certain districts of the PEPSU Union as well as of Rajasthan.

Nangal Dam and Power Project.

82. The work at Nangal Project was started in 1946 and considerable progress has been made. This dam when constructed will not, however, make much advance in regard to the irrigation schemes. The Committee were told that only for a period of about four months in a year it would help irrigation to some extent in a limited area. The main object at present seems to be to expedite the power project. The project will generate 4 lakhs k.w. of firm power at 100 per cent. load factor and 150,000 k.w. of secondary power. Although ultimately this immense power supply will no doubt be of great use, at present it cannot serve much useful purpose as this is not an industrial area. It is expected that the power from this part of the project would be available in 1952, the principal beneficiary being Delhi and the industrial township around Delhi where there is a shortage of power. As in the case of D.V.C., here also the rate of progrtss has not been satisfactory; the over-head charges naturally are getting unnecessarily heavy because all the time the staff is not

being fully utilised. As in the case of D.V.C., here also the important work of irrigation is relegated to a secondary place and power production gets priority. The Committee do not minimise the importance of generation of electricity but from the point of view no national economy, they have a feeling that irrigation should have got priority. It is hoped that with the establishment of the Control Board, preparation of project reports will be more systematically done and before any project is sanctioned the question of priority should be considered.

Bhakra Canal System

83. The second part of the project, the Bhakra Canal system, includes remodelling of the existing Sirhind Canal and Ruper works. During the course of construction of the Bhakra Dam, the river will be diverted by means of two diversion tunnels, 50 ft. wide, which will be bored into sides of the canyon. The Bhakra Main Line will be about 100 miles long and will start from Rupar. It will have a net work of branches, distributories and minor canals. The Nangal Hydel Canal will be about 38 miles long. There will be another canal on the right bank of the Sutlej, a little above the Rupar Weir to serve certain areas of the Bist Doab tract. The Bhakra storage will supply water for the existing Grey Canal System through a new branch with the Sidhwan branch. The total length of the main canals and the branches will be about 538 miles and that of the distributories and minor canals will be 2,400 miles.

Bhakra Dam

84. The height of the Bhakra Dam will be 680 ft., length at road level 1,700 ft., width on top 30 ft., width at base 575 ft., area of the lake 38,000 acres with 56 miles length. Spillway capacity of the Dam will be 4 lakhs cusecs, installed capacity of the Power House No. 1 will be 4 units of 93,300 k.v.a. each and of No. 2 of 8 units with similar capacity each. The Nangal Dam will be 60 ft. high, and the flood capacity will be 3,50,000 cusecs. The Scheme will irrigate 6.6 million acres of land and it is estimated that there will be an extra production of 1.13 million tons of food grains enough to cover about 56 per cent of our annual food shortage of 2 million tons. An extra production of 0.8 million bales of long staple cotton is also expected; this will reduce the country's dependence on foreign cotton. The reservoir will be a large artificial lake at 1,680 ft. above sea-level. The gross storage capacity of the reservoir will be 7.4 million acre-feet.

There will be two spillways, one overflow spillway 220 ft. long with two steeldrum gates situated in the central section of the dam with a discharging capacity of 1,63,000 cusecs. The other spillway at the left abutment and with a capacity of 1,53,000 cusecs will be

an inclined tunnel spillway. It will be controlled by two radial gates expected to be one of the largest of this type. This spillway is to utilize the down-stream portion of the left diversion tunnel at its outfall. There will be about 30 river outlets each regulated with a 96 inches jet flow type gate, passing through the body of the dam and discharging into the spillway section with a capacity of discharging 1,02,500 cusecs. The spillway and outlets will have a capacity of a flood discharge of 4,19,000 cusecs which is much less than the highest recorded flood of the Sutlej (300,000 cusecs, July 1894).

The Punjab Government does not seem to have devoted attention to the construction of these canals as it should have done. It is stated that the phasing of the project would have been better if these canals had been completed along with the Nangal Dam so that irrigation facilities could have been provided in the Bhakra areas at about the same time. The Committee agree with the view held by the Planning Commission that the mistake made should be rectified immediately and all resources should be mobilised to complete the construction of the canals as early as possible.

Diversion Tunnels

85. For the excavation and foundation of construction of the lower portion of Bhakra Dam there will be two complete lined diversion tunnels each of 50 ft. diameter and about half a mile long. Closure gates will be fitted at the upstream ends of the tunnels for shutting of the flow after diversion. These two tunnels have been erected by engineers who are not experts at the job. The Committee feel that it would have been more expeditiously and economically done if the services of the Railway Engineers having experience of making tunnels had been utilized. The recent damage done to the tunnels by flood only confirms the misgivings that there was some defect in the construction. It was admitted by the Chief Engineer when some Members of the Committee visited the project that he expected that the next tunnel would be done more economically and satisfactorily as a result of the experience gained by the construction of the two tunnels that have been completed.

Estimates

86. The total estimated cost of the whole project will be in the neighbourhood of Rs. 137 crores but as far as the Committee have been able to gather this is not an up-to-date estimate. It has been a sad experience of the Committee that due to the rising cost of materials and services three or four years old estimates are exceeded by about 100 per cent. It would have been better for the Government to have a revised up-to-date estimate. The expenditure up to March 1950 was Rs. 13.25 crores and by the end of 1951-52 it is likely to be Rs. 33 crores. The entire cost of the project, *i.e.* 137

crores is to be supplied by the Central Government as loan and eventually the cost would have to be shared between the three State Governments, *viz.* Punjab (I), PEPSU and Rajasthan. It is difficult for the Committee to say how far it would be possible for the Government to supply necessary funds so that the project may be completed within the scheduled time *i.e.* 1958-59. The Committee feel that it is desirable that the financial aspect of the project is examined thoroughly and clearly defined.

The investment of Rs. 137 crores which is likely to increase considerably at the present rate of prices, will give 6.6 million acres of irrigated land and about 4 lakhs of k.w. of electricity. The D.V. Project will irrigate I million acres with an anticipated load of 494,000 k.w. The cost of electricity in both the projects will be about the same, *i.e.*, 0.66 anna per unit in the D. V. and for the Bhakra-Nangal, the cost per unit a little over 6 pies.

Betterment Fees

87. One of the features of the financial arrangements is that there will be a levy of betterment contribution in respect of the lands that would be benefited by this irrigation project. All that is realised in this way would go towards meeting the cost of the project. The idea of levying betterment fees is that since the value of the land covered by the irrigation would be increased considerably as a result of the corporate activity, the benefit accruing should be apportioned between the State and the individual. All the participating Governments have agreed to the levy of the betterment fee. Each partner would have to provide for essential communications and *mandis* in its portion of the project but the schemes for communication in the three areas should be correlated.

Bhakra Control Board

88. *Organisation*: The construction of the Bhakra Dam and the appurtenant works is being done departmentally by the P.W.D. (Irrigation & Electricity Branches) of the Punjab (India) Government. In order to ensure administrative and financial control over the execution of the project, the Bhakra Control Board and the Bhakra Advisory Board have recently been set up by agreement amongst the participating Governments of Punjab (India), PEPSU and Rajasthan. The Control Board consisting of the Governor of Punjab in his personal capacity, two representatives each from the Centre and the Punjab and one representative each of Rajasthan and PEPSU has been entrusted to look after all technical and financial aspects relating to the construction. The actual work of the construction is also carried out under the direction of the Control Board by the Chief Engineer concerned of the State in which the work lies. Except in relation to the construction of the Bhakra Dam and

appurtenant works which lie partly in Punjab and partly in Bilaspur, the work will be done by the Chief Engineer, Punjab. The three Governments have also agreed to delegate powers to respective Chief Engineers to contract for works, supplies and services at the direction of the Control Board. Such contracts to be executed shall be on behalf of the State Government concerned. The Board is assisted by a whole-time Secretary, an officer of the rank of the Superintending Engineer, and a Deputy Secretary, an officer of the rank of Deputy Secretary or Under Secretary, Finance Department and such other staff as may be necessary. The Chief Engineer concerned with any part of the project will be invited to attend as Adviser when matters relating to his part of the project are under consideration of the Control Board.

Functions: The functions of the Control Board are

(i) to scrutinize the estimate of the project prepared by Punjab, advise necessary modifications and recommend the estimate for administrative approval of the Government concerned;

(ii) to examine and approve from time to time the delegation of such powers, both technical and financial, as it may deem necessary for the efficient execution of the project to the Chief Engineers, Superintending Engineers, Executive Engineers and Sub-Divisional Officers engaged in the execution of the project;

(iii) to examine and where necessary lay down specifications and schedule of rates for various classes of work with a view to sound and efficient execution of the project;

(iv) to approve all sub-estimates and contracts, the cost of which exceed the powers of sanction of the Chief Engineers;

(v) to approve all proposals for award of work or supplies on contract other than those based on public tenders and on detailed quantitative estimates and works allotted on work order basis on schedule rates;

NOTE (1).—Where total financial liability under contract is definitely ascertainable at the time of placing the contract and where the contract itself is the result of a public or limited call for tenders, prior submission of the proposals to the Control Board will not be necessary so long as the contract is otherwise within the powers of sanction of Chief Engineers.

NOTE (2).—This will not affect the powers delegated from time to time to the Chief Engineers, Superintending Engineers, Executive Engineers and Sub-Divisional Officers.

(vi) to frame rules as to delegation of powers and procedure for the purpose of carrying out its business;

(vii) to decide after ascertaining the views of the Bhakra Advisory Board the programme of construction of different parts of the project in all the three States, keeping in view the funds available, the economics of the project, and the desirability of obtaining quick results;

(viii) to decide after ascertaining the views of the Bhakra Advisory Board on the stage of development of water-power, and the withdrawals of water from the reservoir during the construction period for irrigation and power purposes with a view to securing the best use of water available;

(ix) to receive monthly progress reports both as to works and expenditure in a prescribed form from the Chief Engineers, review the progress of different units of the project and lay down steps to be taken to expedite the work.

Advisory Board

89. The Bhakra Control Board is assisted by an Advisory Board which has the following constitution and functions.

Constitution:

(i) Consulting Engineer to the Government of India for Water-power, Irrigation and Navigation—(*Chairman*).

(ii) Representative of the Ministry of Finance, Government of India.

(iii) Member, Hydro-Electric, C.W.I.N.C.

(iv) Secretary, Finance, Punjab.

(v) Chief Engineer, Bhakra Dam and Secretary to Government, Punjab.

(vi) Chief Engineer, Bhakra Canals and Secretary to Government, Punjab.

(vii) Chief Engineer, Electricity and Secretary to Government, Punjab.

(viii) Finance Secretary, PEPSU.

(ix) Chief Engineer and Secretary to Government, P.W.D., PEPSU.

(x) Finance Secretary, Rajasthan.

(xi) Chief Engineer, Irrigation, Rajasthan.

(xii) Chief Commissioner, Bilaspur.

The Secretary and the Deputy Secretary of the Bhakra Control Board will also act as Secretary and Deputy Secretary respectively of the Bhakra Advisory Board.

Functions: The functions of the Board will be to advise the Central and State Governments concerned and the Bhakra Control Board on all aspects of Bhakra-Nangal Project and will include the following:

(i) to arrange discussion for facilitating mutual appreciation on the respective view points of the participating Governments in regard to overall plan, the programme and the pace of construction;

(ii) to examine the programme and progress on the project from time to time in the three participating States;

(iii) to resolve differences arising at technical level on the suitability, adequacy or feasibility of any important part of the project; only such differences will be taken up as are admitted by the Consulting Engineers to the Government of India for Water Power, Irrigation and Navigation;

(iv) to advise, at the request of the State Governments concerned, on the internal distribution of the allocated supplies of water from Bhakra to different areas with a view to the optimum utilisation of such supplies.

The meetings of the Advisory Board shall ordinarily be held once every three months and those of the Control Board monthly or as necessary.

Semi-autonomous Boards for State enterprises

90. The Committee observed that the executive side is very often not fully utilized due to the delay in the policy-making. It is apprehended that this project also has suffered on account of such delays in making quick policy decision. It was hoped that with the establishment of the Control Board and the Advisory Board such difficulties would be solved. The Committee were, however, informed that the work is not speedily progressing due to inordinate delays in decision as a result of the Control Board being formed. The Bhakra-Nangal Project originally started as a single State affair but now it is practically the affair of four Governments, the Centre supplying the finance as loans to the three participating State Governments. The Control Board appears to be an *ad hoc* arrangement. The Committee are of opinion that the Government should seriously consider the question of having a permanent and effective body to coordinate the interests of the three States and also the Centre. They are also not quite sure about the utility of nominating the Governor of Punjab as the Chairman of the Control Board in his personal capacity. The Committee feel that after the Gorwala Committee

Report the Government may consider the feasibility of having a semi-autonomous Board for such State enterprises. After the experience of the D.V.C. it is obvious that such Boards should have at least a qualified engineer and a financial expert as members of the Board.

The Committee urge that the Government should consider these questions and make necessary funds available so that the non-provision of funds in time may not impair the speedy execution of the project and render it uneconomic as well as delay the benefits expected to accrue from the project.

Need for strict adherence to target dates

91. It was pointed out to the Committee that the time-table for the execution of the project and for its fulfilment depended upon the rate at which the finance would be made available. There were two alternative time-tables. If the money were to flow rapidly the project was expected to be completed in 1958-59. The other time-table comes into operation only if the money were provided at a slower rate and in that case it would take about three or four years longer. The Committee feel that once the project has been started and agreed upon the work should not be held up or delayed because of funds. This creates material effect on the whole plan of execution the target dates are upset, the estimates become out of date, staff continue in employment without giving adequate outturn of work and the whole development programme is upset and delayed considerably. As the Committee have emphasised elsewhere there should be proper plans before a project is started and money should be provided according to the time-table to be fixed in advance. It is needless to say that by delaying the completion of a project in the middle owing to any cause whatsoever, the whole project becomes expensive in the long run, and the yield diminishes to that extent. Within the money provided, work should be executed according to priorities so that optimum benefit accrues from the earliest possible.

Levy of agricultural income-tax

92. The Committee have been told that a suggestion has been made by the Planning Commission that Government should consider the desirability of exploring other sources of income in the form of levy of agricultural income-tax in consultation with the State Governments. The Committee would like that the Government consider the suggestion carefully and urgently so that the revenues of the State are enhanced which can be utilised towards further development of projects.

Project Reports

93. The Committee noted with surprise that the first project report on the Bhakra-Nangal was received after two years. The

Member of the Planning Commission told the Committee that there was no clearly thought-out programme for the execution of this work. The Committee understand that the question of issuing six-monthly report is now under consideration. The Committee have laid stress elsewhere also for the preparation and submission of the project reports regularly. These reports should show the progress of work and whether the progress is being kept according to the schedule and estimates and the Controlling Authority should ensure that the reports in fact disclose that the work is proceeding according to plans and pre-conceived programme.

Revision of estimates

94. The estimate for the Bhakra-Nangal project was made some five or six years ago. It is clear that this estimate would be now outdated owing to the rise in the cost of machinery and labour. The Committee were unable to find if any attempt had been made to revise these estimates in accordance with the current market position. This is essential as the flow of funds for the projects mostly depend on the estimates and the Government's ability to assess in advance what funds they would be able to provide during a particular year. On this in turn will depend the extent to which the work has to be undertaken in a particular period of time, otherwise the whole thing may proceed in a very haphazard manner each blaming the other for slow progress of work while no one blaming himself that he was responsible for the situation as he did not help in arriving at reasonably correct plans and estimates. The responsibility for ensuring that the plans are properly prepared and the costs are reasonably arrived at in the context of the day to day execution of the work lies both on the executive as well as the policy-making side. Both must share responsibility in equal degree. It is, therefore, essential that timely action should be taken to set right the matter.

Amenities for labourers

95. The Committee noted that the labourers employed in the Bhakra-Nangal Project had to work under great handicaps. The existing facilities in respect of boarding and lodging are inadequate and require considerable improvement. In the interest of efficiency it is essential that all legitimate facilities are provided to the labourers.

Recommendations

96. The Committee would also draw attention to the recommendations contained in Chapter VII and suggest that the organisational set-up of this project should be brought in line with the principles mentioned therein. Other recommendations therein which are applicable to this project should also be adopted.

VI

KAKRAPARA PROJECT

97. This project as it was originally planned consists of a weir at Kakrapara in the lower bridge of the Tapti river and a dam a few miles lower down Ukai. On subsequent re-examination of the project it was found desirable to modify the Scheme to provide a large measure of flood control, perennial irrigation, generation of large block of hydro-electric power and perennial navigation facilities which would improve the economics and Kakrapara project and thus obviate the construction of another dam higher up Ukai for flood control, power generation, etc. as originally planned. The interesting feature of the project is the reclamation of about 4,000 acres of lands. These lands are lying waste at present. It is proposed to reclaim them and make them fit for growing rice.

The Scheme

98. The Scheme is financed by the Government of Bombay from their own resources. The construction of work is, however, entrusted to the Government of India through the agency of the Central Water and Power Commission. The complete Scheme is roughly estimated to cost about Rs. 31 crores, the first phase of the project costing Rs. 12.36 crores. The Government of Bombay have already given approval to undertake the first stage of the construction which would provide perennial irrigation and 25,000 K.W. power.

Organisation

99. The organisation for the construction of the Kakrapara project is more or less on the same lines as devised for the Hirakud, namely, that there is a Chief Engineer in charge of the project who works directly under the Central Water and Power Commission. The Chief Engineer has certain powers delegated to him, but for all other technical and financial sanctions he has to come to the Government of India. To all intents and purposes, the project office is a subordinate office of the Central Water and Power Commission and the difficulties pointed out by the Committee in the case of Hirakud project are present in this case.

On account of the limited time at their disposal the Committee could not examine the project in detail. Moreover the project is still in the elementary stage and the organisation is in the process of being set up.

Recommendations

100. The Committee, however, recommend that the set-up for this project should be organised on the basis of the recommendations and the principles mentioned in Chapter VII, so that the work proceeds on organised lines from the very beginning and is completed within the scheduled time and the estimated cost.

VII

GENERAL RECOMMENDATIONS

101. The Committee have considered the working and organisation of the various authorities responsible for initiating, planning and execution of the various Multi-purpose River Valley Schemes. On the basis of the material placed before them both in writing and orally, and inspection of the sites of the two schemes in progress, they have come to the following conclusions which they recommend for adoption in the case of the schemes which are under construction as well as those which may hereafter be taken up.

Integrated Schemes

102. In the first instance, whenever a scheme is formulated, it should be an integrated scheme, all the aspects of which should be considered together, planned and formulated accordingly. These plans should be complete in all respects. Besides the technical and financial sides which should be carefully examined and considered in detail all other aspects such as land acquisition, training of necessary man power, procurement of stores, plant and machinery, development of industry, utilisation of water and power in proper manner and financing the schemes should be properly conceived, dovetailed and provided for in proper stages in an integrated manner. All these aspects have to be planned in advance and simultaneously so that as far as possible a complete picture is available before the scheme is sanctioned. It is not uncommon that schemes are started before land is acquired, or the adequate supply of technical man power is ensured, or provision for the purchase of stores, etc. is made, with the result that a good deal of money and time is wasted in settling these preliminaries at a time when arrangements for advanced construction work have been made. Similarly the question of utilisation of benefits accruing from a completed scheme is not usually considered in time on a planned basis with the result that there is again waste of time and resources inasmuch as they are not available when they are most needed at the time. The Committee, therefore, lay great stress on total planning and in advance so that everything proceeds on a planned and ordered basis and each one in the chain knows precisely what he has to do and wherein he comes into the picture. An integrated scheme will also enable the top authority to watch the progress in all directions.

One Controlling Authority

103. There should be one authority responsible for the overall control and for watching the progress of all the schemes at the same time as well as individual schemes. This will enable the authority

to co-ordinate the work, to make up for deficiencies to keep a comparative check on the progress and costs and to utilise the resources in an integrated manner with less cost and in an efficient manner. Such an authority must be kept posted with control charts, maps and progress reports from time to time. A Control Room in which such charts, maps and progress reports are maintained should be organised thus enabling the Controlling Authority to know the current position at a glance and to pool and utilise the resources to the maximum extent wherever they are needed. The Committee suggest that the Central Water and Power Commission should be entrusted with this work as they are in a better position to co-ordinate both technical and non-technical aspects of the scheme.

Policy decisions and execution : A three-tier organisation

104. There should be different authorities for giving policy decisions, for initiating and making plans and for executing those plans. There should be clear demarcation of authority and functions among the three. The top authority should concern itself with purely broad policy questions based on an appreciation of complete plans and blue prints of the scheme. The decisions should in no case be given on the basis of rough and vague ideas and incomplete plans. The financial cost of the scheme should invariably be assessed with a reasonable degree of certainty and after taking into account the likely future trends of market as far as possible. The planner should place all the cards face upwards before the policy-maker leaving it to the latter to decide. The policy-maker should in no case proceed until he has complete data before him which he thinks has reasonably been vetted by the technical experts and is not subject to much variation later on. The middle authority should concern itself with fact-finding, initiating and making plans, and, then after the plans have been approved and decided upon to be proceeded with, ensure that the work is proceeding according to the blue print in all its aspects. It should not concern itself with either the policy decisions or the day to day execution of the work. It should function in an advisory capacity both to the policy-maker and the authority responsible for the execution of the work. The last and the third tier should have responsibility limited to the execution of the work. Within its own sphere it must have complete freedom and authority to make decisions on the spot. It should not either assume the role of a planner or the policy-maker. It should work within the blue print framed for it and ensure that the work proceeds efficiently and according to schedule. It should always be prepared and willing to give suggestions which, in the actual course of working, it deems necessary to bring to the notice of the policy-maker through the planner but at the same time ready to leave it to them to give such directions as they make like and then working within the original or revised directions as the case may be. There should be no attempt to impose or obstruct the work of either the planner or the executing agency in any shape or form, unless on good grounds

it is necessary for the policy-maker to intervene and when it is necessary to intervene, he should not waver or delay. The Committee, therefore, recommend strongly this three-tier organisation for the planning, execution and completion of various Multi-purpose River Valley Schemes with clearly defined functions for each. The first tier obviously must consist of the Cabinet which on the advice of the Ministry of Natural Resources and Scientific Research and the Planning Commission and the Central Water and Power Commission will give policy decisions. The functions of initiating and making plans, should vest in the Central Water and Power Commission and giving them a final shape should be the responsibility of the Ministry of Natural Resources and Scientific Research and the Planning Commission in consultation with the Central Water and Power Commission. For the third and the last tier, the Committee suggest the creation of semi autonomous organisations (by statutes of Parliament) with well-defined functions and powers as envisaged above. The present position seems to be a mixture of everything in which the functions of one overlap the responsibilities of the other and seems to have been brought about by satisfying the whims and fancies of individuals with no clear cut plans or schemes behind it. This position will lead to disastrous results in the long run and there is therefore an urgent need for reorganising it immediately on the lines suggested above.

Semi-autonomous Board

105. The question of the set-up of the semi-autonomous authority mentioned in the preceding paragraph is a very important one. At present there is no uniformity. The D.V.C. is an autonomous body created under a statute of Parliament. The Hirakud organisation is practically a subordinate office of the Central Government with some kind of an external Board representing the officers of the Central Government and the State Government of Orissa to watch the progress. Bhakra-Nangal has a different kind of organisation. It is under the charge of a composite Board consisting of officers of the three participating State Governments of the Punjab, PEPSU and Rajasthan with which some officers of the Central Government are also associated. The work is executed by one or the other State Government as the case may be. The Kakrapara organisation is entirely a subordinate office of the Government of India. The decisions are made by the Central Government and the Engineer on the spot has to carry them out. The whole position is far from satisfactory. The autonomous character of the D.V.C. has been taken to extreme limits. The D.V.C. has developed strange conceptions of its autonomy and tried to bypass the authority or advice of the Government. Government in turn have failed to keep it within limits although necessary power is vested in them to do so. The other organisations are *ad hoc* without any clear cut responsibility and functions attached to them. These heterogeneous organisations have no powers to make decisions on the spot but to refer matters

both technical and administrative, to the superior officers for sanction every time. The control boards which are mostly non-technical in character are too unwidely to leave any scope for initiative to the men on the spot which is so necessary for the quick and efficient execution of the projects. The technical engineer on the spot has to ask for decisions from non-technical superiors which leads to waste of time, expenditure and to a certain degree makes him irresponsible or careless about the job. It is, therefore, important that the set-up of the semi-autonomous organisations which the Committee have recommended for the execution of the projects should be clearly defined. There should be a Board of at least three persons, one of whom may be the Chairman. The Chairman should be a man of wide administrative experience capable of administering an organisation of huge dimensions and preferably possessing knowledge of finance or engineering matters. Of the other two members of the Board, one should be an engineer possessing experience in the construction of dams and barrages. He should have also a functional responsibility inasmuch as he will be the Chief Engineer incharge of the whole construction work assisted by various subordinate engineers in different fields—electricity, irrigation, flood control, mechanical etc. The third member of the Board should be the financial adviser in charge of all financial matters of the organisation.

Functions of the Board

106. The Board must have complete powers to work within the framework of the approved plans and estimated costs. The priorities indicated in the blue print of the scheme should be adhered to by the Board. If the Board considers that in the actual working of the scheme some modifications of the original plans and estimates are called for, they should be considered at a joint meeting of the Central Water and Power Commission and the Board and the decision arrived at at such a discussion should as far as possible be final subject to the approval of Government. Variations of plans and estimates should be supported by fuller reasons to enable Government to come to a decision.

Directives from the Centre

107. The minutes of the meetings and the decisions of the Board should from time to time be communicated to the Central Government. It should be the responsibility of the Central Government to examine and study all these minutes and decisions to see that the work is proceeding according to the plans previously prepared and the directions given by them from time to time. The Central Government should immediately draw the attention of the Board to matters which in their opinion need re-consideration and re-examination by the Board and arrive at an agreed conclusion. In the event of a difference between the Central Government and the Board it should be the power of the Central Government to give

directions as they deem fit. The directions given by the Central Government should be issued formally. There should be no informal suggestions or informal references between the Central Government and the Board though there should be no objection to consulting the Board before giving formal directions.

Progress Reports

108. The Board must submit full and complete progress reports of the work every quarter. Details of expenditure and other events of importance should also be included in such progress reports. These progress reports should be laid before Parliament from time to time.

Statements of Expenditure

109. A statement showing the progress of expenditure against sanctioned allotments under each detailed head of account of the work should be prepared and submitted by the Board to the Central Government. Full explanation should be given for the variations between the sanctioned allotment and the actual expenditure. These statements should also be laid before Parliament from time to time.

Appointments

110. All appointments above a certain monetary limit should be made by the entire Board. Key appointments to be specified by the Central Government should be made after their approval. Appointments which are made by the Board either directly or with the approval of the Central Government will be made in accordance with the prescribed rules and regulations framed by the Board in consultation with the Central Government. In framing such rules it will be ensured that each appointment is made by a Committee of not less than three officers after inviting applications and interviewing candidates for the posts and selecting the best out of the lot. The Union Public Service Commission should also be associated in making appointments wherever necessary. There should be uniform rules of employment, terms and conditions of the employees, etc. for all the projects. The Committee also suggest that relations of the various officers and other persons connected with the planning and execution of the various River Valley Schemes should not ordinarily be appointed to any post unless they are selected by the Appointment Boards or the U.P.S.C.

Officers of the Central Government should not be appointed to the Board while they hold appointments under the Central Government. In case any such officer is appointed to the Board or under it he should sever his connections for the time being with the Central Government.

Amenities for Staff

111. The staff employed in the various projects should be given legitimate facilities in so far as their boarding, lodging and other amenities are concerned. There is at present a tendency to over-do it. In the Hirakud project, for example, the staff not only get free quarters, free electricity, water and dearness allowance, but also construction allowance over and above. This in the view of the Committee is unnecessary and must be stopped. There should be either a reasonable allowance or free service in kind. Moreover the necessity for compensation in these respects should not be inflated under a general pretext that the place is out of the way or costly.

Appointment of non-Indians

112. Whenever non-Indians have to be appointed to any post for any reason whatsoever the appointment must be made only after full facts justifying such appointments have been brought to the notice of the Central Government and their approval obtained. In all cases it must be stated why an Indian is not available and why one cannot be trained in a reasonable period of time to man the job. Whenever it is decided to appoint a non-Indian it should be ensured that he is appointed for the minimum period necessary and invariably an Indian should be put as an understudy to him to take over from him in due course.

Consultants and Advisers

113. The practice of appointing too many Consultants and Advisers to the Board should be avoided. Under the scheme as visualised by the Committee the Board will have to function within the plan approved by the Government on the recommendations of the Central Water and Power Commission, who are expected to take all the best and reliable technical advice and it will not be necessary for the Board to take further advice on the approved plans. They should be charged only with the execution of the work and not for sitting in judgement over the approved plans.

Location of the Headquarters Office

114. As far as possible the headquarters office of the project organisation should be located near-about the site. It is essential that the Board watches the progress of the work on the spot and gives directions there and then.

Contracts

115. All contracts for work over and above Rs. 2 lakhs should be sanctioned by the Board. Contracts between Rs. 50,000 and Rs. 2 lakhs should be given with the approval of the Chief Engineer and below Rs. 50,000 by other engineers specified for the purpose by the Board. A list of approved contractors should be obtained either

from the Central Government or the State Government concerned and selection should normally be made out of this list. A schedule of rates should also be maintained and consulted wherever necessary.

Recording of decisions

116. The reasons for all decisions taken by the Board or by the officers from time to time should be recorded in writing and if a decision has been taken on verbal instructions due to exigency of services it should thereafter be reduced in writing and vouchsafed by the officer or person concerned.

Purchases

117. Purchases of stores, plant, equipment and machinery should as far as possible be done through the D.G., Supplies and by the two Purchase Missions in London and Washington. Wherever the Board has been given powers to make direct purchases up to a certain monetary limit the audit should see that the purchases made by the Board or officers direct were necessary and at reasonable rates and under favourable conditions. The audit authority should also comment whether it would have been advantageous if the purchase had been made through the Central Government.

Cost Accounting Section

118. A cost accounting organisation for each project should be set up as soon as the scheme is sanctioned. The organisation should function under the finance member of the Board and point out the bacilli of waste and the directions in which improvement is needed. The Cost Accounting Section should act like searchlights and point out the defects and drawbacks. It is essential that such organisations are set up and their report studied with care and attention.

Overall plans and estimates

119. When any scheme is initiated by the Central Water and Power Commission and plans and estimates therefor are prepared, care should be taken that all technical details in connection with the scheme as well as estimates for each detailed item are worked out simultaneously. At present the tendency is to draw up schemes in barest outlines and to give very general estimate of cost under certain major heads. This is not satisfactory. The scheme must be completely thought out in all its major and minor details and estimates for all items of work prepared. These detailed plans and estimates would help the Government and the Planning and Executive authorities to ensure proper check over the execution of works and the costs.

Finance

120. The Central Government must ensure that once the scheme has been approved by them and put into operation funds flow according to the schedule of work. Government must ensure before starting the plans that they would be in a position to provide the necessary funds. There is a tendency to sanction the schemes and then to leave it to the organisation to come up for funds in a particular year. The Central Government then examines the estimates every year and decides what funds should be made available in a particular year. This higgling and haggling on the provision of funds between the project organisation and the Central Government upsets the whole programme and inevitably leads to waste of manpower, time and energy. The machinery remains idle, the works slow down and the whole organisation gets into a mood of depression and sloth which naturally react on the progress of the scheme as a whole. Under the scheme as envisaged by the Committee if all things are considered in advance and the provision of funds is examined carefully before a scheme is undertaken it should not be difficult for the Government to provide the necessary funds at each stage of the scheme as planned. The Board must also compare the progress of expenditure with the sanctioned allotment under each head of work and as soon as it becomes necessary revise the original estimates and refer the matter to the Central Government who will be in a position to readjust their financial programme. If the costing and financing of the project is not properly envisaged and regulated it will not only be a drain on the present generation but will react on the future generation also.

Betterment fee

121. The Committee understand that there is a proposal to impose a betterment levy on lands which shall be benefited by the Bhakra-Nangal Project. There is also a proposal to impose agricultural income-tax. The idea behind these measures is that the State which has contributed towards the development of land must also get a proportionate share of the additional yield that it will give after the development schemes have all come into operation. The Committee agree that these proposals after they have been carefully considered should be brought before the various legislatures for their approval. There should also be unformity in this respect in so far as other River Valley Schemes are concerned. The money thus collected and also the funds that Government would make available in respect of financing the various River Valley Schemes should be pooled in a Central fund called "The River Valley Development Schemes Fund" and the various river valley projects should be financed out of this fund. This should be a running fund and the unspent balances in any year should not lapse to Government. The Committee feel that if the fund is constituted and properly regulated according to prescribed rules the difficulties of finding finances for the schemes would

diminish to a considerable extent. The Committee would urge that Government should give careful consideration to this aspect of the matter and bring necessary legislation before Parliament for their approval in due course.

Adoption of conventional methods of construction

122. The Committee find that sometimes there is a tendency to change the conventional methods of construction and adopt new fads which have been started as an experiment in other countries. It is true that our country should not lag behind the progress made by the other countries but it is equally necessary that we should not suffer by these experiments. The housing factory is an instance of this point. Without examining whether the pre-fabricated houses would stand the conditions in India a huge factory was organised with the result that the Exchequer had to incur a huge loss and the whole scheme proved to be a failure. Similarly in the midst of the construction of large dams if new experiments are to be made they will result not only in loss of money but delay the benefits accruing therefrom. The Committee have no objection to making experiments with new ideas but they must be made on a small scale in a laboratory and elsewhere, so that when their efficacy is proved under the Indian conditions, they can advantageously be employed in future constructions. Until it is certified by the technical experts that the new methods are the best they should not be introduced in the middle. The Committee strongly recommend that time and money should not be wasted on experiments in the midst of huge constructions and the conventional methods should be adopted as far as possible.

Piece rate of wages

123. The Committee are informed that in cases where a large labour force is required for digging, construction and other purposes it would perhaps be cheaper if piece rate of wages is used. In some cases it might perhaps be necessary to remunerate the gangmen adequately in order to ensure that he obtains the proper amount of work from the labour under him. The Committee suggest that the matter of improving labour remuneration should be explored and instructions issued accordingly.

Audit

124. There should be a provision in the statute itself, creating the authority for the execution of river valley projects, for the audit of expenditure of the projects. The audit should be conducted by a representative of the Comptroller and Auditor General or a commercial auditor appointed by him. The audit staff should be located near the headquarters of the organisation and should do concurrent audit. The report of the auditors should be made to the Auditor-General who will cause to be laid before Parliament. The audit

staff should not only see that expenditure has been incurred according to the sanction issued by the competent authority but also make sure that the sanctions themselves were necessary, *i.e.* the full value of money has been realised. The audit report should be prepared every six months showing the results of audit during the preceding period. The Comptroller and Auditor General should also arrange to submit to Parliament a report on any serious cases of irregularities, fraud, bad management, etc., which may have come to his notice.

Register of technical personnel

125. A register of expert engineers and other technical persons in all branches of engineering likely to be useful in the work of river valley projects should be maintained by the Central Water and Power Commission. Appointments of engineers and other technical persons should be made from this list. The names in the register should not be restricted to any selected engineers. It should contain a list of all the engineers with their qualifications, experience, etc. and the appointing authority should consult this list invariably and take the best man out of the lot.

Parliamentary Control

126. There should be specific machinery for ensuring full Parliamentary control over the various schemes. For this purpose as soon as any scheme has been sanctioned all the plans relating thereto should be laid before Parliament. An explanatory memorandum showing the nature of the scheme, the cost involved, the organisation proposed to undertake the work and other allied matters should also be presented to Parliament along with the plans. Whenever changes in the plans or estimates are required to be made, specific approval of Parliament should be obtained. For this purpose the mere placing of the papers on the Table of the House is not sufficient. A positive motion seeking the approval of Parliament should be brought before it. Every year some time should be set apart in Parliament for the discussion of the progress of work and other allied matters concerning the projects. Before the matter is brought before Parliament or whenever changes are made in the estimates or plans a reference must first be made to the Estimates Committee who will examine the matter on behalf of Parliament and give guidance to the House.

Board of Control

127. When a project is to be undertaken in conjunction with two or more State Governments it should not be a necessary condition to appoint their nominees to the Board. The Central Government should have the final power of constituting the Board in consultation with the State Governments if necessary. In case, there is disagreement the views of the Central Government should prevail. The Board should be a homogeneous one and it is therefore necessary that there should be a single appointing authority for making key appointments to the Board.

Planning Section

128. There should be in the Ministry of Finance a section, called the Planning Section, which should review all the development plans and especially those relating to river valleys from time to time, from the administrative, technical and financial points of view. The reviews may be made quarterly and should state precisely whether the progress of work was commensurate with the expenses involved and if not what were the defects and how they should be rectified. These reviews should be placed before Parliament and the Estimates Committee.

Central Engineering Service

129. The Committee recommend that a Central Engineering Service consisting of Irrigation Engineers should be started so that all the trained engineers could be pooled together and employed on jobs which arise in connection with the schemes.

Training of technical personnel

130. The Committee note with concern that there is paucity of qualified technical men to handle the construction of dams and barrages. The idea of constructing the present river valley schemes was started in 1945 and although more than six years have passed, no effort has been made to see that necessary manpower is trained. The Committee note that only a handful of engineering graduates are being trained at one or two projects and the training of apprentices is not proceeding according to any well-devised programme. There are hundreds of engineering students in the country and it is necessary that capable men are properly trained in the practical working of these projects. The Committee have been told that the training schemes are being dealt with by the Ministry of Education. As observed earlier there is little or no coordination between the various wings of the Government to plan for the various elements relating to a scheme. It is of the utmost importance that adequate manpower is trained for these specialised jobs. For this purpose a training school at each of these projects should be opened where apprentices could be trained in any number. The Committee recommend that Government should consider the matter immediately and provide facilities for promising young men who desire to qualify for the jobs in question. The Committee were informed in this connection that the Orissa Government had been pressing the Government of India to start an Engineering and Technical Institute. It is an important proposal and an institute of this type will go a long way in training our men in the technical construction of dams and projects. The Committee, therefore, recommend that the Central Government may in collaboration with the State Government start an institute of this type. At this juncture when we are harnessing all the water resources of the country for irrigational purposes in order to achieve self-sufficiency in food, our prime need is to make available adequate number of technical men to handle

these various projects which are started from time to time. If an institute of the kind suggested by the Committee is started it should not be difficult to arrange for the funds as all the State Governments for whose benefit the institute will be run will no doubt meet the expenses towards the running of this institute. The proposed institute may also impart training on designs on the lines of Designs Organisation existing in the U.S.A. If a large number of technical men are available the development programme of the country will be quickened and there will be a better inflow of more organised ideas about the various aspects of the designing, constructing and working of the river valley projects. The talent of our own country will be much more useful than any advice purchased at a huge price from foreign countries. The Committee, therefore, urge that an institute may be organised under the control of the Government to meet the pressing needs of the country in this direction.

Expenditure on power generation

131. Taking an over-all view of the Multi-purpose River Valley Projects, the Committee find that a considerable amount of expenditure is spent towards the generation of power. While the Committee quite appreciate the need for the generation of power to improve the economics of the project, they would suggest that it should be made quite certain that the bulk of the generation of power would in fact be advantageously utilised.

Thermal Stations

132. The Committee suggest that the construction of large scale Thermal Stations should not be undertaken along with the River Valley Schemes unless the installation of hydro-electric power stations forms a substantial portion thereof.

Phasing of projects

133. In the interest of national economy and expeditious completion of Irrigation and power projects launched by both the Centre and the States which tend to increase the irrigable resources of the country and thus produce more food should be so phased that the largest possible economies are effected in the amount to be incurred on the purchase of heavy machinery, such as drilling equipments, earth-moving machinery, etc. The coordinating authority should ensure that the different stages of the execution of the various projects are so phased that the machinery released by one is utilised by the other without causing the least delay in the execution of the work of the former and thus preventing further expenditure being incurred on the purchase of heavy machinery which is already available.

Repairs and reconditioning of equipment

134. Before placing indents for machinery abroad, every effort should be made to use the available stores, plants, fixtures, etc. after

necessary repairs and reconditioning. For this purpose a well-equipped workshop should be maintained and as far as possible the existing machinery should be reactivised and used in the other projects and in other stages of the same project.

Stock registers

135. It was brought to the notice of the Committee that stock registers of the various stores, plant and machinery on charge in the various project organisations especially in Hirakud, were not maintained. Such a state of affairs can only be characterised as most unsatsifactory. As a normal precaution, any organisation which has on its charge stores and other equipment should maintain a proper record of receipts and issues. There is also provision under the normal rules for the verification of stocks at stated periods. In the case of these River Valley Organisations it appears that these two fundamental requirements have been over-looked. The Committee suggest that immediate action should be taken to appoint a small committee of two or three engineers unconnected with the river valley organisations to examine whether stock registers of stores are properly maintained and whether a provision for verification of stocks exists. They should also be asked to make specific recommendations as to what concrete steps should be taken for the maintenance of proper registers in which receipts and issues can be entered so that there is no undue loss to Government. The Committee should also assess the loss so far sustained by the various organisations on this account and suggest punishments if losses have occurred through the negligence of persons concerned. This is a very important matter to which Government should give earnest attention immediately so that machinery worth crores of rupees is preserved in proper conditions and not frittered away. The Comptroller and Auditor General should also ensure that his audit staff conduct a test check of the stocks on charge of the various organisations and bring to notice cases of irregularities in his audit report.

Misuses of vehicles

136. A large number of vehicles, trucks, motor cars, etc. are maintained by each river valley organisation for transporting material from one site to another or for carrying staff engaged on construction from one place to another. The Committee understand that such vehicles, etc., are maintained above the normal requirements and the excess is used for purposes other than those mentioned above. It is also the practice to allot cars, trucks, etc. to individual officers exclusively for their use. It is also alleged that they are misusing them for their private purposes and that these vehicles are used by the families and friends of officers at Government expense. This is very unhealthy from the point of view of efficient working of the project organisations. Strict orders should be issued that no car or vehicle is used except on official purposes and that the expenditure is controlled by enjoying upon the administrative authorities, to keep

strict watch over the movement of trucks and by surprise visits. Notice should be taken of any irregularity that may come to the knowledge of Government and it should be put down promptly.

Distinct agencies for different functions

137. It was noticed in the case of D.V.C. that agencies entrusted with designing of projects were also entrusted with the construction of the same. It was also noticed that an agency or associate agency, which was responsible for supplying stores, plant or machinery was entrusted with the inspection of such stores. The Committee cannot but view this arrangement with misgivings and recommend that such practices should be avoided in future. There should be separate and distinct agencies for carrying out different functions mentioned above. Otherwise the whole process would be open to all kinds of abuse.

Economy

138. The Committee cannot evaluate in terms of money the economy that would accrue immediately as a result of the acceptance of the recommendations made by them. They are, however, confident that if their recommendations are accepted they will lead to a saving of crores of rupees ultimately and also result in the planned development of the Country, more food production in a shorter time and rapid industrialisation and raising of living standards.

Sd. M. ANANTHASAYANAM AYYANGAR.

NEW DELHI;
The 5th March, 1952.

APPENDIX I

Statement showing the summary of the recommendations of the Estimates Committee relating to the estimates of the Central Water and Power Commission and the Multi-purpose River Valley Schemes.

Serial No.	Ref. to para. No. of the Report	Summary of recommendations
1	2	3
		THE CENTRAL WATER AND POWER COMMISSION
1	13	The Chairman of the Commission should not have any *ex-officio* status in the Ministry nor should he be responsible for any administrative decisions on behalf of the Ministry. The duties of the Commission should be limited to initiating, of coordination and furthering schemes for the conservation and utilization of water resources throughout the country. The functions relating to the construction of projects should be taken away from the Commission and entrusted to separate *ad hoc* bodies.
2	14	The Commission should make plans and designs, draw up accurately the estimates, indicate priorities in respect of schemes and the target dates within which different stages, of schemes should be completed. In short the Commission must prepare a complete blue print for a particular scheme in order to enable the Government to come to conclusions as to the necessity and advisability of undertaking a particular scheme at a particular time. In case the scheme is finally undertaken, it should also be the function of the Commission to indicate the manpower required and the machinery, plants and tools needed and how they can be procured. The activities of the Commission in regard to the development of River Valley Schemes should be confined to irrigation, navigation, flood control, water logging and hydro-electric power generation.
3	15	A Committee consisting of the Chairman of the Commission and Secretaries of the Ministries of Finance and Natural Resources and Scientific Research should be appointed under the chairmanship of the Minister of Natural Resources and Scientific Research to scrutinize the detailed plans, etc., of a scheme. The schemes as approved by this Committee should be referred to the Planning Commission, and after the Commission has advised on the priority or on the question of undertaking the scheme the whole scheme together with the recommendations of the Planning Commission should be considered by the Cabinet and further action taken in accordance with their orders. Any variations from the principles underlying the scheme should not ordinarily be made without the prior approval of the Cabinet.

4	16	A list of experienced engineers who have rendered at least 15 years service as Executive or Superintending Engineers and above, in all branches, and from all parts of the country should be drawn up for various posts in the Commission. The Chairman and Members of the Commission should each be qualified engineers possessing high technical qualifications and vast experience in the respective branches of engineering.
5	17	As a result of the reorganisation of the various Branches of the Commission recommended by the Committee, the number of Directors in the Commission should be reduced from nine to five, with a corresponding reduction in the rank of Deputy, Assistant and Extra Assistant Directors. (*Minus* 4 Directors, 7 Deputy Directors and 9 Extra Assistant Directors).
6	18	Schemes involving expenditure of non-productive nature, such as construction of buildings and filling up of posts for which there is not adequate work, etc., should be deferred. The proposed expansion and reorganisation of the Research Station at Poona should be reviewed and no further financial commitments made unless there is a definite possibility of expansion of work in the near future. The posts of Research Officers and Assistant Research Officers, which have been lying vacant at this Station, should be kept in abeyance.
7	19, 20	(*i*) In the event of the investigations of certain river valley Projects being stopped or in the case of investigations of the Kosi Project being concluded, the following gazetted and non-gazetted staff would be rendered surplus :
		Class I 31
		Class II 29
		Class III 440
		Class IV 193
		(*ii*) A Committee consisting of the representatives of the Ministries of Home Affairs, Finance and Natural Resources and Scientific Research should be set up to examine in detail the reorganisation of the Commission and effect an overall reduction in staff both gazetted and non-gazetted, consequent on the discontinuance of investigation work as mentioned above. Until the reorganisation of the Commission Office has been completed no new posts either in the gazetted or non-gazetted cadre should be created or filled up.
8	21	The expenditure on Travelling Allowances should be drastically cut and frequent touring of officers should be stopped. Expenditure on T.A. and under the head "Other charges" should be reduced by at least 50 per cent.
		DAMODAR VALLEY PROJECT
9	28	A Committee should be appointed to investigate the work done by the Rehabilitation and Development Department and whether the work done is commensurate with the money spent and whether this work should more properly be entrusted to the State Governments. The findings of the proposed Committee should be placed before the Estimates Committee.

1	2	3
10	36	The question of the cost of prouction of power should be studied carefully and the result of such studied placed before the Estimates Committee in due course.
11	38	The Estimates Committee should be informed in due course of the result of investigations being carried out by the Government for keeping the overhead charges at the lowest level possible.
12	40	(i) The Bokaro Thermal Station should be completed as early as possible. A body of experts should investigate whether full value of the money spent on this project has been obtained. (ii) An expert body should examine whether indigenous talent would not have done the work in respect of the Konar Dam at a lesser cost.
13	42	The Committee appointed to investigate the work of the Rehabilitation and Development Department should go into the question of cost of reclamation and rehabilitation of displaced persons. The Committee should also investigate whether it would be possible to reduce the cost reclamation by grants of money, sites for residential quarters and fields for cultivation.
14	46	The Damodar Valley Corporation should be reconstituted on the pattern of semi-autonomous bodies recommended by the Committee *vide* Serial No. 36 under "General" so as to include a qualified engineer and a financial expert besides an administrator for the efficient conduct of activities of the Corporation.
15	50	The methods for tapping available technical manpower in India should be improved and clearly laid down.
16	51	A suitable Indian Engineer should be placed as an under-study to the present American Chief Engineer, so that he is fully equipped with all the technical and administrative experience by the time he is called upon to take over the charge of Chief Engineer of the Project when the present Chief Engineer retires on the conclusion of his term of appointment. The selection of such a person should be entrusted to a Committee of Experts of which the present Chief Engineer should be the Chairman.
17	55	The figures of net revenue worked with reference to the capital outlay are contingent upon the fulfilment of a certain progress, timely investment according to schedule and the income as anticipated. As there are apparent catchear in these three factors and the results cannot be expected to flow as anticipated, a thorough investigation should be made to arrive at as near a correct figure as possible.
18	57	The Corporation should have given higher priority to flood control and irrigation instead of the construction of Thermal Station, as the scheme was originally conceived as a flood control measure. The work of flood control and irrigation could have been completed at a far less cost than that incurred on the Thermal Station and the esults would have been more useful for the country's benefit.

19	70, 71	(*i*) The administrative set-up of this project should be remodelled. (*ii*) An officer of sufficient seniority and with sufficient authority should be appointed as Financial Adviser so that he may be able to take independent decisions on the spot. The position of the Financial Adviser should be defined in the manner recommended by the Committee.
20	72	It is a waste of talented manpower to appoint Executive Engineers or Assistant Engineers as Personnel Assistants to Senior Officers to look after their office work. Government should review the whole organisation to ensure that technical men are not appointed to non-technical posts.
21	74	There should be a proper system for the preparation and submission to the Controlling authority of monthly progress reports on the project. The controlling authority should ensure that the progress shown in these reports is keeping in line with the plans, the schedule of dates and estimates of costs.
22	75	The revised estimates in respect of the project should be prepared in detail in the light of the current information and the programme of expenditure to be incurred each year should be recast so that there is even flow of funds and both the Central and the Orissa Governments are in the know of the current position.
23	77	Grant of the Construction Allowance to the staff should be discontinued, as the provision of rent-free quarters and free supply of water and electricity afford adequate relief to the staff for loss or other amenitities.
24	78	The Chief Engineer should not give all the contracts himself as at present. The Superintending Engineer should sanction contracts up to Rs. 50,000 and the Chief Engineer between Rs. 50,000 and Rs. 2,00,000. All works costing more than Rs. 2 lakhs should be given out on contract after approval by the Contract Board consisting of the Chief Engineer of Orissa, Chairman of the Central Water and Power Commission, the Chief Engineer and Financial Adviser of the Hirakud Project.
25	79	There is no justification for sanctioning the posts of gazetted Personal Assistants in the rank of Assistant Engineer and S. D. Os. to look after the custody of the machinery. Indiscriminate sanctioning of gazetted and non-gazetted posts should cease. All posts should be created with the approval of an Appointment Board consisting of the Chief Minister of Orissa Government, Financial Adviser, the Chief Engineer, Hirakud and the Chairman of the Central Water and Power Commission. Before sanctioning a post the Board should call for complete data and examine the volume of work involved therein carefully. The reasons for the creation of each post should be recorded in writing and the financial effects worked out in advance.
26	80	The Appointment Board referred to above should also consider reduction of the over-staffed Chief Engineer's office and reorganize the staff after prescribing proper scales of work for all posts.

1	2	3
		BHAKRA-NANGAL PROJECT
27	90	Government should seriously consider the question of having a permanent and effective body to coordinate the interests of the three participating States and the Centre. The appointment of an *ad hoc* Control Board with the Governor of Punjab as the Chairman in his personal capacity does not appear to be satisfactory. Government should consider the feasibility of having a semi-autonomous Board for such State enterprises with a qualified engineer and a financial expert as members. Government should consider the above questions and make necessary funds available so that the non-provision of funds in time may not impair the speedy execution of the project and render it uneconomic.
28	92	Government should consider in consultation with the State Government concerned the desirability of exploring other sources of income in the form of levy of agricultural income-tax in order to increase the revenues for financing the scheme.
29	94	The estimates of the project prepared five or six years ago should be revised in accordance with the current market conditions in order to enable Government to assess the total expenditure required to finance the scheme.
30	95	Adequate amenities, such as proper accommodation in healthy surroundings, should be provided for the labourers engaged in the execution of the project.
31	96	The organisational set-up of the Bhakra-Nangal Project should be remodelled as per the principles laid down by the Committee.
		KAKRAPARA PROJECT
32	100	This project should also be modelled on the principles enunciated and brought in line with the organisational set-up of the other big projects so that the work proceeds on organised basis from the very beginning and is completed within the scheduled time and the estimated cost.
		GENERAL
33	102	(i) Whenever a scheme is formulated, it is essential that all detailed aspects pertaining to finance, technical side of the scheme, acquisition of land, training of manpower, procurement of stores, plants and machinery, prospects of development of industry, utilization of water and power are properly conceived, dovetailed and provided for at proper stages and in an integrated manner. There should be total planning in advance including the question of utilisation of benefits accruing from a completed scheme, so that everything proceeds on a planned and ordered basis and each one in the chain knows precisely what he has to do and wherein he comes into the picture. An integrated scheme will also enable the top authority to watch the progress in all directions.

34 | 103 | There should be one Controlling Authority for the overall control and for watching the progress of all the schemes at the same time as well as the individual schemes. Such an authority must be kept posted with control charts, maps and progress reports from time to time, which should be maintained in control room thus enabling the Controlling Authority to know the current position at a glance and utilise the resources to the maximum extent wherever they are needed. The Central Water and Power Commission should be entrusted with this work as they are in a better position to coordinate both technical and non-technical aspects of such schemes.

35 | 104 | There should be a three-tier organisation for the planning, execution and completion of various Multi-purpose River Valley Schemes with clearly defined functions for each. The first tier should consist of the Cabinet, which on the advice of the Ministry of Natural Resources and Scientific Research, the Planning Commission and the Central Water and Power Commission will give policy decisions. The functions of initiating and making plans should vest in the Central Water and Power Commission which would act as fact finding and initaiting agency. They would collect data, make plans and frame estimates. It should be the responsibility of the Ministry of Natural Resources and Scientific Research and the Planning Commission, in consultation with Central Water and Power Commission and the Ministry of Finance to give these plans and estimates the final shape. The third tier is the creation of semi-autonomous organizations (by statute of Parliament) with well defined functions and powers, which would be charged with the responsibility of constructing the project on the lines of approved plans and within the estimates framed therefor.

36 | 105 | Steps should be taken to set up on a uniform basis semi-autonomous boards for the execution of the River Valley Projects with clearly defined functions. For the efficient running of such organisations there should be a Board consisting at least of three persons, one of whom may be the Chairman, who should have wide administrative experience, and preferably possessing knowledge of finance or engineering matters. Of the other two members, one should be an engineer with vast experience in construction of dams, barrages and should have functional responsibility inasmuch as he will be the Chief Engineer of the project. The third member should be the Financial Adviser in charge of all financial matters of the organisation.

37 | 106 | The Board should have complete powers to work within the frame work of the approved plans and estimates of cost and should strictly adhere to the priority indicated in the blue print of the scheme. If any modifications of the original plans and estimates are considered necessary, they should be decided at a joint meeting of the Central Water and Power Commission and the Board and their decisions submitted to Government for approval.

38 | 107 | The minutes of the meetings and decisions of the Board should be communicated to the Central Government, who should consider and see that the work is proceeding according to the approved plans and estimates. Government should immediately draw the attention of the Board to matters which require reconsideration by the Board and arrive at agreed conclusions. In the event of a difference between the Government and the Board it should be for the Government to give directions as they deem fit. The directions given by the Central Government should be issued formally and there should be no informal suggestions or references between the Government and the Board.

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39	108, 109	The Board should submit to Government complete quarterly progress reports and statements or expenditure against sanctioned allotments together with full explanation for variations, if any, which should be laid before Parliament.
40	110	(*i*) All appointments above a certain monetary limit should be made by the Board as a whole. The key appointments, specified by the Central Government, should be made after their approval. The U.P.S.C. should also be associated in making appointments wherever necessary. All appointments should be made in accordance with the rules and regulations framed by the Board in consultation with the Central Government. (*ii*) Officers of the Central Government should not be appointed to the Board while they hold appointments under the Central Government. In case any such officer is appointed, he should sever all connections with the Central Government.
41	111	The staff employed in the various projects should be given legitmate facilities and amentities in regard to accommodation, supply of electricity, water, etc., but a tendency of over-doing it should be curbed. There should either be a reasonable allowance or free service in kind but not both. The grant of Construction Allowance to the staff at Hirakud must be stopped.
42	112	.All appointments should as far as possible be filled by Indians. Whenever non-Indians have to be appointed, the appointment must be made after full facts justifying such appointments have been furnished to the Central Government and their approval obtained. In case of appointment of a non-Indian, the appointment should be only for a minimum period and a competent Indian should invariably be put as an under study to enable him to take over the duties in due course.
43	113	The practice of appointing too many Consultants and Advisers to the Board should be avoided.
44	114	The headquarters office of the project organization should be located nearabout the site to enable the Board to watch the progress of work.
45	115	All contracts for work over and above Rs. 2 lakhs should be sanctioned by the Board. Contracts between Rs. 50,000 and Rs. 2 lakhs should be given with the approval of the Chief Engineer and below Rs. 50,000 by other Engineers specified for the purpose by the Board. Lists of approved contractors and a schedule of rates should be maintained for consulation.

46	116	The reasons for all decisions taken by the Board or by the Officers from time to time should be recorded in writing.
47	117	Purchases of stores, plant, equipment and machinery should bas far as possible be done through the D.G., Supplies and by the two Purchase Missions in London and Washington. Direct purchases made by the Board up to certain authorised monetary limits should be checked by audit to see whether they were made at reasonable rates and under favourable conditions and also whether it would have been advantageous if the purchases had been made through the Central Government.
48	118	A Cost Accounting Organization for each project should be set up as soon as the scheme is sanctioned, and should act as a search-light, point out the becilli of waste and the directions in which improvement is needed.
49	119	When any scheme is initiated by the Central Water and Power Commission, all aspects of the scheme, technical details and the major and minor details of plants should be carefully considered and proper estimates for every item of the scheme also prepared simultaneously.
50	120	Government must ensure provision of adequate finance before starting a scheme. Once a scheme has been approved by them and put into operation funds should flow according to the schedule of work.
51	121	Government should give careful consideration to the institution of a central fund called "The River Valley Development Schemes Fund" for financing the River Valley Schemes and bring necessary legislation before Parliament for its approval. There should also be uniformity in the betterment levy in respect of the various River Valley Schemes.
52	122	Wasteful experiments should on no account be initiated in the midst of huge constructions and the conventional methods of proved efficacy should be strictly adhered to.
53	123	The question of imporoving labour remuneration should be explored and in cases where large labour force is employed piece rate of wages should preferably be enforced.
54	124	There should be a provision in the statute itself for the audit of expenditure of the project. (*i*) Audit should be conducted by a representative of the Comptroller and Auditor-General or a Commercial Auditor appointed by him. (*ii*) Audit staff should be located at the headquarters of the organization to conduct concurrent audit. (*iii*) The report of the auditors should be made to the Comptroller and Auditor-General who will cause it to be laid before Parliament.

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		(*iv*) The Comptroller and Auditor-General should arrange to submit to Parliament a report on any serious cases of irregularities, fraud, bad management, etc., which may come to his notice.
55	125	A register of expert engineers and other technical persons together with their respective qualifications, experience, etc. (who are likely to be useful for the work of the River Valley Projects) should be maintained by the Central Water and Power Commission. Appointments should invariably be made from this list.
56	126	There should be specific machinery for ensuring full control of Parliament over the various schemes. All plans, estimates etc. relating to a scheme should be laid before Parliament, with a positive motion seeking its approval thereto. Similarly whenever any changes in the plans or estimates are required to be made, specific approval of Parliament should be obtained.
57	127	The Board of Control should be a homogeneous one and there must be a single appointing authority for making key appointments to the Board. When a project is undertaken in conjunction with one or more State Governments, the Central Government should have the final power of constituting the Board in consultation with the State Governments concerned, if necessary.
58	128	There should be in the Ministry of Finance a Planning Section to review all development plans relating to the river Valley Schemes from the administrative, technical and financial points of view. All such reviews should be placed before Parliament and the Estimates Committee.
59	129	A Central Engineering Service consisting of Irrigation Engineers should be started from which trained engineers could be drawn for work on various schemes.
60	130	The Central Government should in consultation with the State Governments, consider the question of starting an Engineering and Technical Institute for the training of promising young men in order to meet the paucity of qualified technicians to handle the constructions of dams and barrages. This institute may also impart training on designs on the lines of Designs Organisation existing in the U.S.A.
61	131	It should be ensured that the bulk of the generation of power derived from the Multi-purpose River Valley Projects would be advantageously utilized, as it is observed that considerable amount of expenditure is at present being incurred towards the generation of Power.

62	132	The construction of large scale Thermal Stations should not be undertaken under a River Valley Scheme unless the installation of hydro-electric power stations forms a necessary part of the project.
63	133	There must be methodical phasing of different stages of the execution of projects so that the machinery and equipments released by one may be used at another, without causing any delay in the execution of work and thus preventing expenditure being incurred on the purchase of heavy machinery which is already available.
64	134	A well-equipped workshop should be maintained for carrying out repairs and reconditioning of machinery, plant etc. Before placing indents for machinery abroad every steps should be taken to use the available stores and plants, etc, and as far as possible the existing machinery should be reactivised and used in the projects.
65	135	Immediate action should be taken to appoint a Committee of two or three engineers, unconnected with the river valley organization, which should examine and make recommendations regarding the prower maintenance of stock registers and verification of stores, equipments, etc. That Committee should assess the loss so far sustained by the various organisations on this account and suggest punishments if losses have occurred through the negligence of the persons concerned.
66	136	There should be strict orders against the misuse of vehicles, trucks, motor cars, etc. maintained by the project organisations and expenditure thereon should be controlled. No car or vehicle should be used except on official purpose.
67	137	There should be separate and distinct agencies for carrying out different functions of the projects and the practice of entrusting and associating a designing agency for supplying stores, plant or machinery and inspection of the same should be avoided.

APPENDIX II

Explanatory note relating to the Organisational and Control Chart of Multi-Purpose River Valley Schemes

The Central Water and Power Commission will collect data, make plans and prepare estimates of expenditure in report of river-valley schemes.

[Paragraph 4]

2. The Ministries of N. R. & S. R. and Finance and the Planning Commission will consider the blueprint prepared by the Central Water and Power Commission and on their advice the Cabinet will give broad policy decisions.

[Paragraphs 15, 104]

3. After the Cabinet has approved the plans, their decisions will be communicated to the Ministry of N. R. & S. R. who will cause a Board to be set up to undertake the implementation of the project on the lines of approved plans and within the sanctioned estimates.

[Paragraph 104]

4. The Board will be set up under a statute of Parliament and will consist of a Chairman, an Engineer-Member and a Finance Member. The Board will be assisted by a Secretary and other subordinate officers on the Technical, Administration, Finance and Accounting sides organized into different self-contained Branches.

[Paragraph 105]

5. A Control Room shall be set up under the C.W.P.C. and will be fitted with charts, graphs and maps indicating the up-to-date information regarding the details of the overall schemes, the progress made, the estimates of expenditure, details of actual expenditure, target dates of the completion of the various stages of the schemes and other useful information. These charts should be completed in respect of individual schemes as well as the total number of schemes.

[Paragraph 103]

6. River Valley Development Fund will be created for financing the projects and will be placed under the charge of the Ministry of Finance. Contributions to the Fund will be made by the Government of India and the participating States.

[Paragraph 121]

7. A section in the Ministry of Finance should be organized to review all Development Schemes from the administrative, technical and financial points of view. These reviews should be placed before the Estimates Committee and Parliament.

[Paragraph 128]

8. By a provision in the Statute the responsibility for audit of expenditure incurred by the projects will vest in the Comptroller and Auditor-General of India. His Audit Report will be laid before Parliament through the Ministry of Finance and will be considered by the Public Accounts Committee.

[Paragraph 124]

9. All approved plans and estimates, progress charts and reviews of schemes will be laid before Parliament. They will also be considered by the Estimates Committee from time to time.

[Paragraph 126]

10. Whenever modifications to the original plans or estimates of expenditure become necessary at the instance of either the Board of the C.W.P.C. they will be considered at a joint meeting of the Board, the Central Water and Power Commission, Ministries of N. R. & S. R. and Finance and the Planning Commission. They will then be submitted to the Cabinet and thereafter to Parliament for approval. The revised plans and estimates will be given effect to only after their approval by the Estimates Committee and Parliament.

[Paragraph 126]

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